

STEPHENS ELECTRONICS, INC

3513 PACIFIC AVENUE, BURBANK, CALIFORNIA 91505

PHONE: (213) 842-5116

ENGINEERING COMMUNIQUE #3

JULY 21, 1980

RE: The discrepancy in high frequency record calibration
when using high output tapes.

The purpose of this communique is to discuss the problem of playing back 10 kHz at zero level at 15 ips when the recorder is aligned to the NAB standard.

The original 15 ips standard included compensation for high frequency bias loss (erasure). Through the years, the NAB standard tapes have been re-calibrated to compensate for drift made in the original calibrations. Due to the improved efficiency of the top end of the latest high output tapes (Ampex 456 for example), the playback response may be +1 dB or more at 10 kHz even with no record equalization on Stephens recorder/reproducers. This is due to our superior high frequency record response.

It has come to our attention that we are not the only ones having this problem. The NAB standard for 15 ips is again in need of re-calibration. An AES Committee recognizes this and the new standard tapes may closely match the European CCIR curve.

SEI suggests in the meanwhile calibrating the playback equalization at 10 kHz to be -2 dB when referenced to 1 kHz when playing back a standard alignment tape. The alternative is to insert a high frequency roll-off network in the record electronics for compensation. This would introduce additional phase shift and a reduction in the high frequency signal-to-noise ratio.

If you have any questions please call us. We would also appreciate your response to our solution.

STEPHENS ELECTRONICS, INC.

Doug Cioce
Director of Operations



RECORDING SERVICES COMPANY

2414 W. OLIVE AVE.
BURBANK CA. 91506
(818) 843-8640
(800) 451-5614

4/20/85

JAMACA/WARNER BROS. PICTURES

TO AUDIO ENGINEER:

HINTS ON STEPHENS OPERATION:

The machine has been aligned for +6, 30ips, 250 tape, using the sample tape given us by Steve Goldman. All functions check out 100%. If you need assistance, call RSC 800-451-5614, or (818) 843-6800, talk to Julie or Tom or Ken.

Tones have been recorded on the reel of 250 tape at the head. I suggest if they playback even close to 0 VU in Jamaca, not to realign. If realignment is necessary overbias 1 db @ 1 K for best flat frequency response. DO NOT adjust low frequency response, it should be close to 0 VU.

Enclosed is a 220 V to 110 V step down transformer for the machine. We think the Power in Jamaca is 50 hz, 220 V, so PLEASE use the transformer for the Stephens machine. Also, please try to get as much air as possible to the Power Supply since it will probably get warmer than normal running on 50 hz.

The speed of the machine uses a 60 hz crystal time base so the Jamaca 50hz. will not be a problem - only the 220V.

At the rear of the machine is a switch for external sync resolving. IMPORTANT the switch is in the "NORMAL" POSITION, at all times. Please check upon arrival in Jamaca.

To arm machine for record use the knob on the right hand side of the VU meter panel while depressing the "REC" button next to it (NOT DECK record button). This is also used for the other functions - input, Play, Mute (you won't need Mute). Depress the "play" one to deselect from record ready.

All other functions of the machine are very similar to any studio recorder, the enclosed manual covers tape threading etc. however refer to the previous paragraph for Channel select functions on the multiplexing of the VU panel.

CIRCUIT	CONN. PIN NO.				WIRE CDR
	CH1	CH2	CH3	CH4	
VU PB LEVEL	11B	11D	11F	11H	4 WHT/ORG
PB OUT	12A	12C	12E	12G	4 WHT/BLU
PB IN	2A	2C	2E	2G	4 WHT/GRN
SHUTTLE MUTE	13B	13B	13B	13B	1 RED/WHT
3D IPS CONTROL	6A	6A	6A	6A	1 GREY
RECORD INPUT	4A	4C	4E	4G	4 WHT/RED
PRESET	6C	6C	6C	6C	1 VIOLET
OUTPUT TO REC AMP	5B	5D	5F	5H	4 BLK/WHT
GROUND	13D	13F	13H	1	BUSS WIRE
READ/WRITE INPUT THIS CHANNEL	8A	8C	8E	8G	4 WHT
RECORD READ/WRITE ALL CHANNELS	7H	7H	7H	7H	1 RED
SYNC READ/WRITE ALL CHANNELS	7F	7F	7F	7F	1 BLUE
INPUT READ/WRITE ALL CHANNELS	7D	7D	7D	7D	1 GRN
RECORD BUSS	6G	6G	6G	6G	1 WHT/VIO
SYNC BUSS	6E	6E	6E	6E	1 WHT/GREY
SYNC RELAY THIS CHANNEL	9B	9D	9F	9H	4 YEL
RECORD RELAY THIS CHANNEL	10A	10C	10E	10G	4 WHT/BRN
DOLBY	1B	3B	3D	7D	4 WHT/YEL
B ⁻ AUDIO	3F	3F	3F	3F	1 ORG
B ⁻ LOGIC	3H	3H	3H	3H	1 BRN/WHT

HERWISS:
CAPACITANCES IN MICROFARADS.

S ELECTRONICS

APPROVED BY: *[Signature]*

DRAWN BY: *Lalit*

REVISED: JFS

AMP SCHEMATIC

ELECTRONICS

DRAWING NUMBER: SC-1901

5-17-82

01-17-83

PRICE LIST
LED'S

PAGE 1

ITEM CODE	DESCRIPTION	BASE PRICE	100	250	500	1000	2500
LN 21 RAHL	RED LED LAMP	.130	.104	.095	.087	.082	.079
LN 21 RCPHL	RED LED LAMP	.130	.104	.095	.087	.082	.079
LN 21 RPH	RED LED LAMP	.130	.104	.095	.087	.082	.079
LN 21 RPHL	RED LED LAMP	.130	.104	.095	.087	.082	.079
LN 28 RA	RED LED LAMP	.130	.104	.095	.087	.082	.079
LN 28 RP	RED LED LAMP	.130	.104	.095	.087	.082	.079
LN 31 GCPHL	GREEN LED LAMP	.193	.154	.141	.129	.121	.117
LN 31 GPH	GREEN LED LAMP	.193	.154	.141	.129	.121	.117
LN 31 GPHL	GREEN LED LAMP	.193	.154	.141	.129	.121	.117
LN 38 GP	GREEN LED LAMP	.193	.154	.141	.129	.121	.117
LN 41 YCPHL	AMBER LED LAMP	.193	.154	.141	.129	.121	.117
LN 41 YPH	AMBER LED LAMP	.193	.154	.141	.129	.121	.117
LN 41 YPHL	AMBER LED LAMP	.193	.154	.141	.129	.121	.117
LN 48 YP	AMBER LED LAMPS	.193	.154	.141	.129	.121	.117
LN 513 OA	ORANGE 7-SEG DISPLAY	1.925	1.540	1.401	1.286	1.209	1.170
LN 513 OK	ORANGE 7-SEG DISPLAY	1.925	1.540	1.401	1.286	1.209	1.170
LN 513 OA	GREEN 7-SEG DISPLAY	1.399	1.119	1.018	.935	.879	.851
LN 513 OK	GREEN 7-SEG DISPLAY	1.575	1.260	1.147	1.052	.989	.958
LN 513 RA	RED 7-SEG DISPLAY	1.250	1.000	.910	.835	.785	.760
LN 513 RK	RED 7-SEG DISPLAY	1.250	1.000	.910	.835	.785	.760
LN 514 OA	ORANGE 7-SEG DISPLAY	2.100	1.680	1.529	1.403	1.319	1.277
LN 514 OK	ORANGE 7-SEG DISPLAY	2.100	1.680	1.529	1.403	1.319	1.277
LN 514 OA	GREEN 7-SEG DISPLAY	1.775	1.420	1.292	1.186	1.115	1.079
LN 514 OK	GREEN 7-SEG DISPLAY	1.775	1.420	1.292	1.186	1.115	1.079
LN 514 RA	RED 7-SEG DISPLAY	1.450	1.160	1.056	.969	.911	.882
LN 514 RK	RED 7-SEG DISPLAY	1.450	1.160	1.056	.969	.911	.882
LN 516 OA	ORANGE 7-SEG DISPLAY	2.875	2.300	2.093	1.921	1.806	1.748
LN 516 OK	ORANGE 7-SEG DISPLAY	2.875	2.300	2.093	1.921	1.806	1.748
LN 516 OA	GREEN 7-SEG DISPLAY	2.425	1.940	1.765	1.620	1.523	1.474
LN 516 OK	GREEN 7-SEG DISPLAY	2.425	1.940	1.765	1.620	1.523	1.474
LN 516 RA	RED 7-SEG DISPLAY	1.588	1.270	1.156	1.061	.997	.966
LN 516 RK	RED 7-SEG DISPLAY	1.588	1.270	1.156	1.061	.997	.966
LN 524 OA	ORNG 2-DIGIT DISPLAY	2.875	2.300	2.093	1.921	1.806	1.748
LN 524 OK	ORNG 2-DIGIT DISPLAY	2.875	2.300	2.093	1.921	1.806	1.748
LN 524 OA	GRN 2-DIGIT DISPLAY	2.425	1.940	1.765	1.620	1.523	1.474
LN 524 OK	GRN 2-DIGIT DISPLAY	2.425	1.940	1.765	1.620	1.523	1.474
LN 524 RA	RED 2-DIGIT DISPLAY	2.100	1.680	1.529	1.403	1.319	1.277
LN 524 RK	RED 2-DIGIT DISPLAY	2.100	1.680	1.529	1.403	1.319	1.277
LN 526 OA	ORANGE	3.175	2.540	2.311	2.121	1.994	1.930
LN 526 OK	ORNG 2-DIGIT DISPLAY	3.175	2.540	2.311	2.121	1.994	1.930
LN 526 OA	GRN 2-DIGIT DISPLAY	2.425	1.940	1.765	1.620	1.523	1.474
LN 526 OK	GRN 2-DIGIT DISPLAY	2.425	1.940	1.765	1.620	1.523	1.474
LN 526 RA	RED 2-DIGIT DISPLAY	2.100	1.680	1.529	1.403	1.319	1.277
LN 526 RK	RED 2-DIGIT DISPLAY	2.100	1.680	1.529	1.403	1.319	1.277
LN 5260 OA	ORNG 2-DIGIT DISPLAY	2.820	2.256	2.053	1.884	1.771	1.715
LN 81 RCPHL	ORANGE LED LAMP	.193	.154	.141	.129	.121	.117
LN 81 RPH	ORANGE LED LAMP	.193	.154	.141	.129	.121	.117
LN 81 RPHL	ORANGE LED LAMP	.193	.154	.141	.129	.121	.117

T A W ELECTRONICS, INC.

4215 W. BURBANK BLVD.

BURBANK, CALIFORNIA 91505

L.A. (818) 846-3911

TELEX : 71-3718354

F.O.B. BURBANK, CALIFORNIA

NO. CA. (408) 738-1795

TWX : 310-3718354

PRICES SUBJECT TO CHANGE WITHOUT NOTICE

OUT CA. (800) 255-9538

TERMS

NET 30 DAYS

ITEM CODE	DESCRIPTION	RESISTANCE RANGE	PACKAGE (MIN.)	BASE PRICE	600	1000	5000
<u>CARBON FILM T(JAPAN), JF(JAPAN), & PF(PIHER)</u>							
T 10J	1/8W 5% CF RES	2.2Ω to 1 meg	200	16.84	14.72	11.78	10.72
T 10J	1/8W 5% CUT & FORM	2.2Ω to 1 meg	1000	18.11	15.83	12.67	11.53
T 10J	1/8W 5% CF TAPE/REEL	2.2Ω to 1 meg	5000	18.52	16.19	12.96	11.79
JF 25J	1/4W 5% JF RESISTORS	1Ω to 10 meg	200	9.14	7.99	6.40	5.82
JF 25J C/F	1/4W 5% JF C/F	1Ω to 10 meg	1000	13.47	11.78	9.42	8.58
JF 25J T/R	1/4W 5% JF T/R	1Ω to 10 meg	5000	13.90	12.15	9.73	8.85
JF 25K2	1/4W 10% JF RESISTORS	11m to 22m	200	35.79	31.29	25.03	22.78
JF 25K2 C/F	1/4W 10% JF C/F	11m to 22m	1000	37.04	32.38	25.91	23.58
JF 25J T/R	1/4W 5% JF T/R	10.1m to 22m	5000	37.48	32.77	26.21	23.86
PF 25J	1/4W 5% PF RESISTORS	1Ω to 10 meg	TAPE	11.75	10.28	8.22	7.48
PF 25J0	1/4W 5% 0 ohm RES	"0"Ω	TAPE	19.33	16.90	13.52	12.31
PF 25J2	1/4W 5% PF RESISTORS	11m to 14m	TAPE	23.05	20.15	16.12	14.67
PF 25K3	1/4W 10% PF RESISTORS	15m to 20m	TAPE	23.05	20.15	16.12	14.67
PF 25K4	1/4W 10% PF RESISTORS	22 meg	TAPE	52.80	46.16	36.93	33.61
PF 50J	1/2W 5% PF RESISTORS	.5Ω to 10m	TAPE	20.08	17.56	14.05	12.78
PF 100J	1W 5% PF RESISTORS	10Ω to 10m	TAPE	113.03	98.80	79.05	71.94

(TAPE MINIMUM -- 100 pcs. per value)

METAL OXIDE RSF(Micro-Japan)

RSF 1B	METAL OXIDE 1W 5% RES	.2Ω to 120K	100/bulk	101.25	77.76	63.59	60.75
RSF 2B	METAL OXIDE 2W 5% RES	.2Ω to 120K	100/bulk	138.75	106.56	87.14	83.25

METAL FILM MK(RESISTA, W. GERMANY), PMR(PIHER, SPAIN)

Temperature Coefficient: D(100ppm/c°) C(50ppm/c°) E(25ppm/c°) F(15ppm/c°)

MK2-0 RN55 size	1/4W 1% MF RES 50ppm	1Ω to 9.76Ω	TAPE	60.06	46.62	38.23	35.07
MK2-1	1/4W 1% MF RES 50ppm	10Ω to 976K	TAPE	50.05	38.85	31.86	29.23
MK2-2	1/4W 1% MF RES 50ppm	1m to 3.92m	TAPE	85.86	66.60	54.61	50.10
MK2-3	1/4W 1% MF RES 50ppm	4.02m to 10m	TAPE	200.02	155.40	127.41	116.90
*MK2-25PPM-1	1/4W 1% MF RES 25ppm	10Ω to 449K	TAPE	174.46	135.42	111.03	101.87
*MK2-25PPM-2	1/4W 1% MF RES 25ppm	511K to 1m	TAPE	197.34	153.18	125.59	115.23
*MK2-15PPM (.1%)	1/4W .1% MF RES 15ppm	100Ω to 100K	TAPE	686.40	532.79	436.83	400.79
PM-25	1/4W 1% MF RES 100ppm	10Ω to 1m	TAPE	20.67	16.05	13.16	12.07
MK3-0	1/2W 1% MF RES 50ppm	1Ω to 9.76Ω	TAPE	100.10	77.70	63.71	58.45
MK3-1	1/2W 1% MF RES 50ppm	10Ω to 976K	TAPE	85.60	66.60	54.61	50.10
*MK3-2	1/2W 1% MF RES 50ppm	1m to 3.92m	TAPE	122.98	95.46	78.27	71.81
*MK3-3	1/2W 1% MF RES 50ppm	4.02m to 10m	TAPE	237.38	184.26	151.07	138.61

(TAPE MINIMUM -- 25 pcs. per value)

CARBON COMPOSITION RCO7(JAPAN)

RCO7J-1	1/4W 5% CC RES	2.2Ω to 6.2m	100/bulk	51.25	39.36	32.19	30.75
RCO7J-2	1/4W 5% CC RES	6.8m to 10m	100/bulk	97.50	74.88	61.23	58.50

100 minimum per value of same wattage may be combined for next column price.

*Delivery quoted at time order is placed.

For larger quantity and program pricing - contact TAW

TAW ELECTRONICS, INC.

4215 W. BURBANK BLVD.

BURBANK, CA 91505

L.A. (818) 846-3911

TELEX: 71-3718354

F.O.B. BURBANK, CA

NO. CA. (408) 738-1795

TWX: 310-3718354

PRICES SUBJECT TO CHANGE

OUT CA. (800) 255-9538

TERMS NET 30 DAYS

METAL FILM

MK

GENERAL INFORMATION

Construction

Metal film resistors with heavily tinned, easily solderable wire leads. Welded end caps, multi-lacquered body. Color blue.

Military equivalent

MIL-R-10509 RN60 RN 65

MIL-R-10509 char. C, E and F
MIL-R-55182
MIL-R-22684
IEC 115 type I

STANDARD VALUES AND TOLERANCES

Type	MK 2	MK 3
	1/4W	1/2 W
Range	1 ohm to 10M	
Tolerance	±1%,	

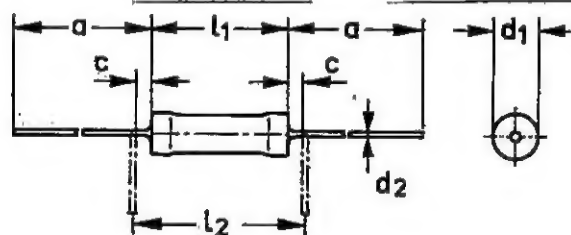
*All types available with ±50 * 25 = 15ppm

PERFORMANCE CHARACTERISTICS

Specification	Symbol	MK 2	MK 3
Power rating			
@ 40°C		0.5	0.6
@ 70°C	W	0.4	0.5
@ 125°C		0.18	0.25
Max. operating voltage	V	250	300
Breakdown voltage	V _{eff}	>500	>500
Insulation resistance	M~	>10 ⁷	>10 ⁷
Self-capacitance	pF	<0.2	<0.3
Voltage coefficient	1/V	<10 ⁻⁷	<10 ⁻⁷
Noise	uV/V	See Curves	
Harmonic ratio	dB	See Curves	
Thermal resistance	°C/W	220	180
Thermal time constant	sec.	10	25
Failure rate		<1X10 ⁻⁸	<1X10 ⁻⁸
Long-term exposure per IEC, 56 days, 40°C, 90 - 95% relative humidity	$\frac{\Delta R}{R}$	<.5%	<.5%

MANUFACTURED BY RESISTA, W. GERMANY

Dimension	inches	MK 2	MK 3
d ₁		.098 - .004	.126 - .008
l ₁		.236 - .028	.335 - .039
a		1.339±.039	1.417±.039
c*		≤ .079	≤ .079
d ₂		.024	.024
l _{2min.}		.295	.492



COLOR CODE BANDS

Ohms:	Black - 0	Green - 5
	Brown - 1	Blue - 6
	Red - 2	Violet - 7
	Orange - 3	Grey - 8
	Yellow - 4	White - 9

Tolerances:	Brown - ±1%	Green - ±0.5%
	Red - ±2%	Blue - ±0.25%
	Gold - ±5%	Violet - ±0.1%
	Silver - ±10%	Grey - ±0.05%
	Without - ±20%	

STOCKING DISTRIBUTOR

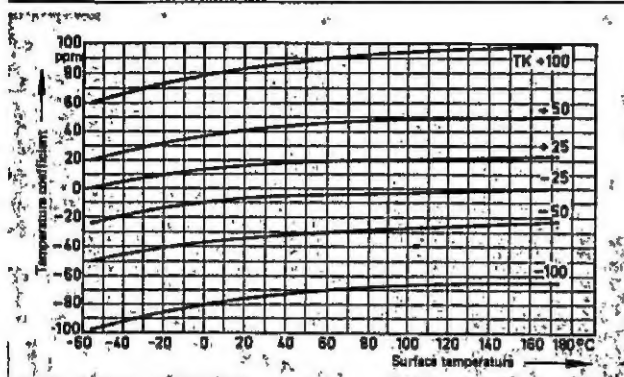
TW TAW ELECTRONICS, INC.
4215 WEST BURBANK BLVD. • BURBANK, CA 91505

818-846-3911 LOS ANGELES
408-738-1795 NORTHERN CALIFORNIA
1-800-255-9538 OUTSIDE CALIFORNIA
TELEX: 71-3718354 • TWX: 310-3718354

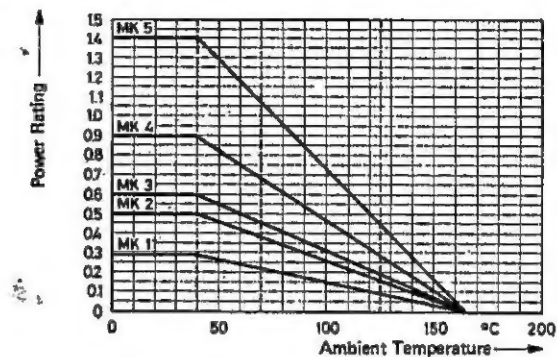
Graphs next page

DATE 6/1/83

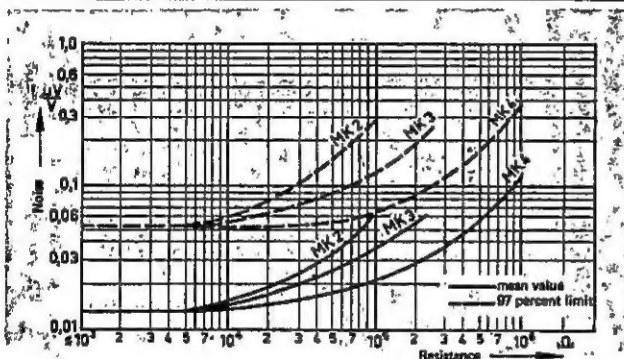
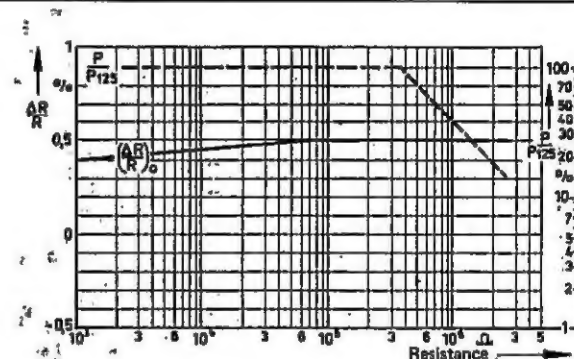
TYPICAL PERFORMANCE CURVES

TEMPERATURE COEFFICIENT
PPM = $f(T)$

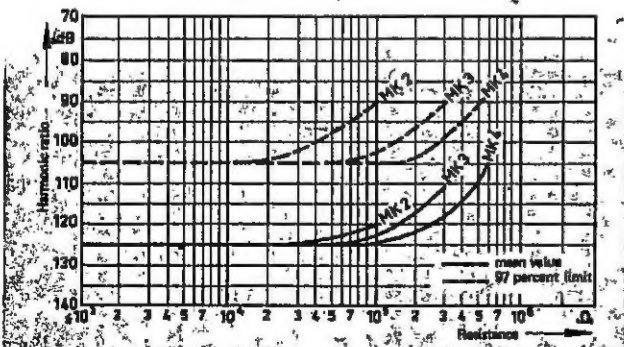
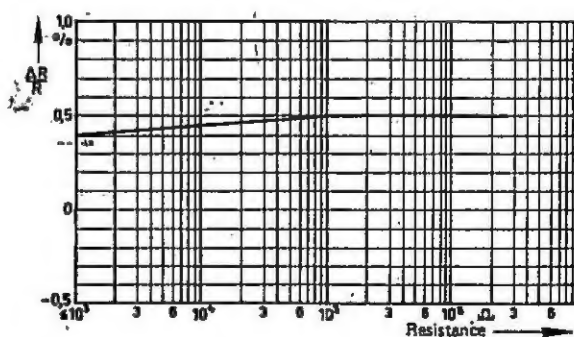
DERATING



NOISE

LIFE TEST
according to IEC 1000 h, P₁₂₅

HARMONIC RATIO

STORAGE
at 170°C, 1000 h

Ceramic Disc Capacitors

TYPE TCO 12 VDCW							
CAP MFD	TOL.	TYPE	E.I.A. T.C.	MAX DIA.	MAX THK	LEAD SPACING	LEAD DIA.
INCHES							
.1	+80%-20%	TCO104Z	Y5T	.354	.156	.250	.025
.1	+80%-20%	TCO104Z	Y5S	.315	.156	.250	.025
.22	+80%-20%	TCO224Z	Y5T	.512	.156	.250	.025
.47	+80%-20%	TCO474Z	Y5T	.610	.156	.375	.025

TYPE TCL 16 VDCW							
CAP MFD	TOL.	TYPE	E.I.A. T.C.	MAX DIA.	MAX THK	LEAD SPACING	LEAD DIA.
.01	±20%	TCL103M	Z5R	.250	.187	.250	.025
.022	±20%	TCL223M	Z5R	.300	.187	.250	.025
.033	±20%	TCL333M	Z5R	.340	.187	.250	.025
.05	±20%	TCL503M	Z5R	.330	.187	.250	.025
.1	±20%	TCL104M	Z5R	.380	.156	.375	.025
.22	±20%	TCL224M	Z5R	.555	.187	.375	.025
.33	±20%	TCL334M	Z5R	.625	.187	.375	.025
.47	±80-20%	TCL474Z	Z5R	.625	.187	.375	.025

TYPE TCA 25 VDCW							
CAP MFD	TOL.	TYPE	E.I.A. T.C.	MAX DIA.	MAX THK	LEAD SPACING	LEAD DIA.
.002	+80-20%	TCA223Z	Z5V	.156	.156	.250	.025
.033	+80-20%	TCA333Z	Z5V	.315	.156	.250	.025
.05	+80-20%	TCA503Z	Z5V	.315	.156	.250	.025
.068	+80-20%	TCA683Z	Z5V	.450	.156	.375	.025
.1	+80-20%	TCA104Z	Z5V	.450	.156	.375	.025

TYPE TCD 50 VDCW +80% - 20%							
CAP MFD	TOL.	TYPE	E.I.A. T.C.	MAX DIA.	MAX THK	LEAD SPACING	LEAD DIA.
.005	+80-20%	TCD502Z	Z5V	.250	.156	.250	.025
.010	+80-20%	TCD103Z	Z5V	.250	.156	.250	.025
.020	+80-20%	TCD203ZS	Z5V	.325	.156	.250	.025
.020	+80-20%	TCD203Z	Z5V	.315	.156	.375	.025
.025	+80-20%	TCD253Z	Z5V	.400	.156	.375	.025
.030	+80-20%	TCD303Z	Z5V	.400	.156	.375	.025
.050	+80-20%	TCD503Z	Z5V	.400	.156	.375	.025
.068	+80-20%	TCD683Z	Z5V	.515	.156	.375	.025
.1	+80-20%	TCD104Z	Z5V	.515	.156	.375	.025

TYPE TCD 50 VDCW ±20%							
CAP MFD	TOL.	TYPE	E.I.A. T.C.	MAX DIA.	MAX THK	LEAD SPACING	LEAD DIA.
.01	±20%	TCD103M	Z5U	.315	.156	.250	.025
.015	±20%	TCD153M	Z5U	.394	.156	.250	.025
.022	±20%	TCD223M	Z5U	.394	.156	.250	.025
.033	±20%	TCD333M	Z5U	.515	.156	.375	.025
.047	±20%	TCD473M	Z5U	.625	.156	.375	.025
.050	±20%	TCD503M	Z5U	.625	.156	.375	.025

TYPE TCP 100 VDCW							
CAP MFD	TOL.	TYPE	E.I.A. T.C.	MAX DIA.	MAX THK	LEAD SPACING	LEAD DIA.
.005	±20%	TCP-R005	Z5U	.390	.156	.250	.025
.01	±20%	TCP-R01	Z5U	.390	.156	.250	.025
.02	±20%	TCP-R02	Z5U	.440	.156	.250	.025
.025	±20%	TCP-R025	Z5R	.440	.156	.250	.025
.03	±20%	TCP-R03	Z5U	.590	.156	.375	.025
.05	±20%	TCP-R05	Z5U	.625	.156	.375	.025
.1	+80%-20%	TCP-R1	Z5U	.725	.156	.375	.025

SPECIFICATIONS:

TEMPERATURE CHARACTERISTICS: See Table 1
 OPERATING TEMPERATURE: See Table 1
 TEST VOLTAGE: For 12 through 100 VDC - 250% of rated voltage.

For 1000VDC - 200% of rated voltage.

INSULATION RESISTANCE: 75,000 Megohms min. @ Working Voltage

Q (Ratio of Reactance to Equivalent Series Resistance)

Capacitance $\leq 30\text{pf}$ $Q \geq 400 + 20 \times \text{Cpf}$

Capacitance $> 30\text{pf}$ $Q \geq 1000$

CAPACITANCE VS. TEMPERATURE CHARACTERISTICS:

See performance curves.

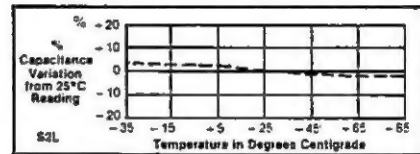
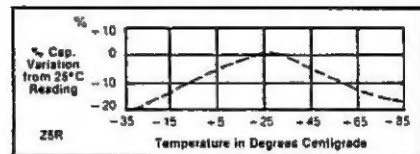
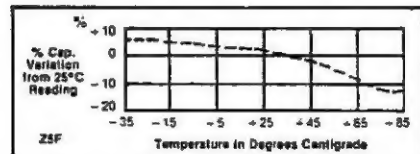
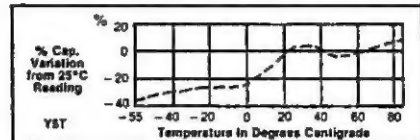
DISSIPATION FACTOR:

For Z5F, Z5R, Z5U 2.5% Max. @ 1 KC and 25°C

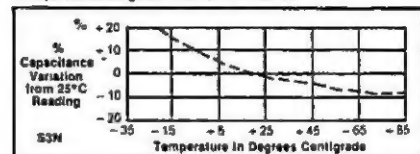
Z5V 5.0% Max. @ 1 KC and 25°C

S2L, S3N 0.6% Max. @ 1 MC and 25°C

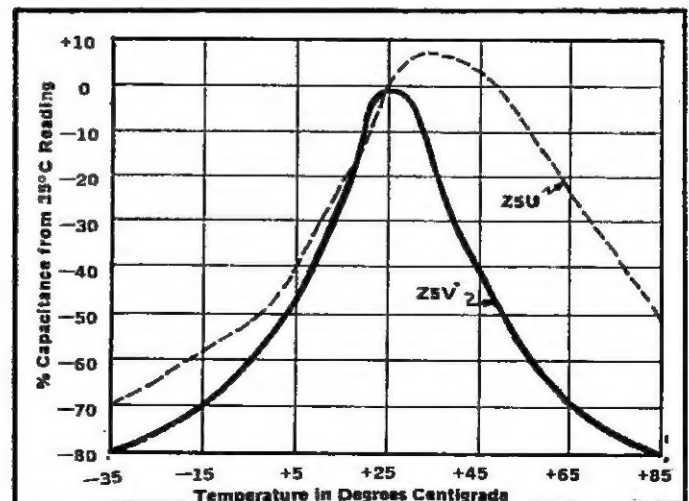
PERFORMANCE CURVES



S2L CHARACTERISTIC:
 N330 ± 500 parts-per-million per-degree C (PPM/°C) maximum capacitance change from +25°C reading over temperature range of -35°C to +85°C.



S3N CHARACTERISTICS:
 N3300 ± 2500 parts-per-million per-degree C (PPM/°C) maximum capacitance change from +25°C reading over temperature range of -35°C to +85°C.



**GENERAL PURPOSE
CERAMIC DISC CAPACITORS
1000 VDCW**

TYPE CCD 1000VDW

Capac. pf	Tol	Char.	Part No.	Dia.	Lead Spacing	Thk.	Lead Dia.		Capac. pf	Tol.	Char.	Part No.	Dia.	Lead Spacing	Thk.	Lead Dia.	
Inches									Inches								
3.3	± .5 pf	S2L	CCD-3R3	.290	.250	.156	.025		*360	± 10%	Z5F	CCD-361	.290	.250	.156	.025	
5	± 10%	S2L	CCD-050	.290	.250	.156	.025		390	± 10%	Z5F	CCD-391	.290	.250	.156	.025	
*6	± 10%	S2L	CCD-060	.290	.250	.156	.025		400	± 10%	Z5F	CCD-401	.290	.250	.156	.025	
6.8	± 10%	S2L	CCD-6R8	.290	.250	.156	.025		470	± 10%	Z5F	CCD-471	.290	.250	.156	.025	
7.5	± 10%	S2L	CCD-7R5	.290	.250	.156	.025		500	± 10%	Z5R	CCD-501	.290	.250	.156	.025	
*8	± 10%	S2L	CCD-080	.290	.250	.156	.025		*510	± 10%	Z5R	CCD-511	.290	.250	.156	.025	
10	± 10%	S2L	CCD-100	.290	.250	.156	.025		560	± 10%	Z5R	CCD-561	.290	.250	.156	.025	
12	± 10%	S2L	CCD-120	.290	.250	.156	.025		*600	± 10%	Z5R	CCD-601	.290	.250	.156	.025	
15	± 10%	S2L	CCD-150	.290	.250	.156	.025		680	± 10%	Z5R	CCD-681	.290	.250	.156	.025	
18	± 10%	S2L	CCD-180	.290	.250	.156	.025		750	± 10%	Z5R	CCD-751	.290	.250	.156	.025	
20	± 10%	S2L	CCD-200	.290	.250	.156	.025		800	GMV	Z5U	CCD-801G	.290	.250	.156	.025	
22	± 10%	S2L	CCD-220	.290	.250	.156	.025		820	± 20%	Z5U	CCD-821	.290	.250	.156	.025	
*24	± 10%	S2L	CCD-240	.290	.250	.156	.025		*910	± 20%	Z5U	CCD-911	.290	.250	.156	.025	
25	± 10%	S2L	CCD-250	.290	.250	.156	.025		1000	± 10%	Z5R	CCD-102	.385	.250	.156	.025	
27	± 10%	S2L	CCD-270	.290	.250	.156	.025		*1000	GMV	Z5U	CCD-102G	.290	.250	.156	.025	
30	± 10%	S3N	CCD-300	.290	.250	.156	.025		1200	± 10%	Z5R	CCD-122	.385	.250	.156	.025	
33	± 10%	S3N	CCD-330	.290	.250	.156	.025		*1300	± 10%	Z5R	CCD-132	.385	.250	.156	.025	
33	± 10%	N1500	CCD-330M	.280	.250	.156	.025		1500	± 20%	Z5U	CCD-152	.385	.250	.156	.025	
39	± 10%	S3N	CCD-390	.290	.250	.156	.025		*1500	GMV	Z5U	CCD-152G	.290	.250	.156	.025	
47	± 10%	S3N	CCD-470	.290	.250	.156	.025		*1600	± 20%	Z5U	CCD-162	.385	.250	.156	.025	
50	± 10%	S3N	CCD-500	.290	.250	.156	.025		*1800	± 20%	Z5U	CCD-182	.385	.250	.156	.025	
*51	± 10%	S3N	CCD-510	.290	.250	.156	.025		2000	GMV	Z5U	CCD-202G	.385	.250	.156	.025	
56	± 10%	S3N	CCD-560	.290	.250	.156	.025		2200	GMV	Z5U	CCD-222G	.385	.250	.156	.025	
68	± 10%	S3N	CCD-680	.290	.250	.156	.025		2500	GMV	Z5U	CCD-252G	.385	.250	.156	.025	
75	± 10%	S3N	CCD-750	.290	.250	.156	.025		2700	GMV	Z5U	CCD-272G	.385	.250	.156	.025	
82	± 10%	S3N	CCD-820	.290	.250	.156	.025		3000	GMV	Z5U	CCD-302G	.385	.250	.156	.025	
91	± 10%	S3N	CCD-910	.290	.250	.156	.025		3300	GMV	Z5U	CCD-332G	.590	.375	.156	.025	
100	± 10%	S3N	CCD-101	.290	.250	.156	.025		3900	GMV	Z5U	CCD-392G	.590	.375	.156	.025	
120	± 10%	S3N	CCD-121	.290	.250	.156	.025		4000	GMV	Z5U	CCD-402G	.590	.375	.156	.025	
130	± 10%	S3N	CCD-131	.290	.250	.156	.025		4300	GMV	Z5U	CCD-432G	.590	.375	.156	.025	
150	± 10%	S3N	CCD-151	.290	.250	.156	.025		4700	± 20%	Z5U	CCD-472	.590	.375	.156	.025	
180	± 10%	S3N	CCD-181	.290	.250	.156	.025		5000	± 20%	Z5U	CCD-502	.590	.375	.156	.025	
200	± 10%	S3N	CCD-201	.290	.250	.156	.025		5600	GMV	Z5U	CCD-562G	.590	.375	.156	.025	
220	± 10%	Z5F	CCD-221	.290	.250	.156	.025		6800	GMV	Z5U	CCD-682G	.590	.375	.156	.025	
240	± 10%	Z5F	CCD-241	.290	.250	.156	.025		*7500	GMV	Z5U	CCD-752G	.590	.375	.156	.025	
250	± 10%	Z5F	CCD-251	.290	.250	.156	.025		8200	GMV	Z5U	CCD-822G	.690	.375	.156	.025	
270	± 10%	Z5F	CCD-271	.290	.250	.156	.025		10000	± 20%	Z5U	CCD-103	.690	.375	.156	.025	
300	± 10%	Z5F	CCD-301	.290	.250	.156	.025		*10000	GMV	Z5U	CCD-103G†	.590	.375	.156	.025	
330	± 10%	Z5F	CCD-331	.290	.250	.156	.025		15000	+80-20%	Z5U	CCD-153†	.690	.375	.156	.025	
350	± 10%	Z5F	CCD-351	.290	.250	.156	.025		20000	+80-20%	Z5U	CCD-203†	.690	.375	.156	.025	
									30000	+80-20%	Z5U	CCD-303†	.900	.375	.156	.025	
									50000	+80-20%	Z5U	CCD-503†	.875	.375	.250	.025	

**Table 1
Temperature Characteristics**

Symbol	Z5	Y6	X5
Temp. Range For	+10	-30	-55
Characteristic	Thru	Thru	Thru
Determination (°C)	+85	+85	+85

Symbol	E	F	P	R	T	U	V
Max. Cap. Change (%)	4.7	+7.5	±10	+15	+22	+22	+22
Over Temp. Range					-33	-56	-82

† Indicates 600 VDCW
GMV Indicates Guaranteed Minimum Value.

DATE: 1-1-84

STOCKING DISTRIBUTOR

TAW ELECTRONICS, INC.
4215 WEST BURBANK BLVD. • BURBANK, CA 91505

818-846-3911 LOS ANGELES
408-738-1795 NORTHERN CALIFORNIA
1-800-255-9538 OUTSIDE CALIFORNIA
TELEX: 71-3718354 • TWX: 310-3718354

PRICE SCHEDULE

2-1-85

DISC CAP

Price Per Each

Cap.	Tol.	Volts	Dia.	L/S	1-99	100	500	1M	Cap.	Tol.	Dia.	L/S	1-99	100	500	1 M	
3.3 pf-910		1000	.290	.250	.089	.069	.057	.052	16 VOLT - continued								
1000 pf	10%	1000	.385	.250	.097	.076	.062	.057	.1	20%	TCL-104M	.380	.375	.135	.105	.086	.079
1000 pf	GMV	1000	.290	.250	.097	.076	.062	.057	.22	20%	TCL-224M	.555	.375	.223	.173	.142	.131
1200	10%	1000	.385	.250	.097	.076	.062	.057	.33	20%	TCL-334M	.625	.375	.521	.404	.331	.304
1300	10%	1000	.385	.250	.112	.087	.071	.065	.47	+80-20	TCL-474Z	.625	.375	.498	.387	.317	.291
1500	10%	1000	.385	.250	.112	.087	.071	.065	25 VOLT								
1500	GMV	1000	.290	.250	.112	.087	.071	.065	.022	+80-20	TCA-223Z	.315	.250	.083	.065	.052	.049
1600	20%	1000	.385	.250	.112	.087	.071	.065	.033	+80-20	TCA-333Z	.315	.250	.106	.082	.068	.062
1800	20%	1000	.385	.250	.112	.087	.071	.065	.05	+80-20	TCA-503Z	.315	.250	.112	.087	.071	.065
2000	20%	1000	.385	.250	.112	.087	.071	.065	.068	+80-20	TCA-683Z	.450	.375	.146	.113	.093	.085
2000	GMV	1000	.385	.250	.112	.087	.071	.065	.1	+80-20	TCA-104Z	.515	.375	.175	.136	.111	.102
2200	GMV	1000	.385	.250	.112	.087	.071	.065	50 VOLT								
2500	GMV	1000	.385	.250	.118	.091	.075	.069	.005	+80-20	TCD-502Z	.250	.250	.046	.036	.029	.027
2700	GMV	1000	.385	.250	.118	.091	.075	.069	.01	+80-20	TCD-103Z	.250	.250	.049	.038	.031	.029
3000	GMV	1000	.385	.250	.123	.096	.079	.072	.02	+80-20	TCD-203Z	.325	.250	.055	.042	.035	.032
3300	GMV	1000	.590	.375	.118	.091	.075	.069	.025	+80-20	TCD-253Z	.400	.375	.069	.054	.044	.040
3900	GMV	1000	.590	.375	.118	.091	.075	.069	.03	+80-20	TCD-303Z	.400	.375	.080	.062	.051	.047
4000	GMV	1000	.590	.375	.118	.091	.075	.069	.05	+80-20	TCD-503Z	.400	.375	.095	.074	.060	.055
4300	GMV	1000	.590	.375	.118	.091	.075	.069	.068	+80-20	TCD-683Z	.515	.375	.129	.100	.082	.075
4700	20%	1000	.590	.375	.118	.091	.075	.069	.1	+80-20	TCD-104Z	.515	.375	.183	.142	.117	.107
5000	20%	1000	.590	.375	.118	.091	.075	.069	50 VOLT - 20%								
5600	GMV	1000	.590	.375	.118	.091	.075	.069	.01	20%	TCD-103M	.315	.250	.060	.047	.038	.035
6800	GMV	1000	.590	.375	.118	.091	.075	.069	.015	20%	TCD-153M	.394	.250	.069	.054	.044	.040
7500	GMV	1000	.590	.375	.172	.133	.109	.100	.022	20%	TCD-223M	.394	.250	.095	.074	.060	.055
8200	GMV	1000	.690	.375	.172	.133	.109	.100	.033	20%	TCD-333M	.515	.375	.106	.082	.068	.062
10,000	20%	1000	.690	.375	.183	.142	.117	.107	.047	20%	TCD-473M	.625	.375	.140	.105	.089	.082
10,000	GMV	1000	.590	.375	.183	.142	.117	.107	.05	20%	TCD-503M	.625	.375	.140	.109	.089	.082
15,000	+80-20	600	.690	.375	.206	.160	.131	.120	100 VOLT								
20,000	+80-20	600	.750	.375	.343	.267	.219	.201	.005 pf	20%	TCP-R005	.390	.250	.097	.076	.062	.057
30,000	+80-20	600	.875	.375	.455	.353	.290	.266	.01	20%	TCP-R01	.390	.250	.100	.078	.064	.059
50,000	+80-20	600	.875	.375	.489	.380	.311	.286	.02	20%	TCP-R02	.440	.250	.118	.091	.075	.069
500 VOLT									.025	20%	TCP-R025	.440	.250	.135	.105	.086	.079
.1	+80-20	CCD-104Z	.551	.354	.775	.602	.493	.453	.03	20%	TCP-R03	.590	.375	.135	.105	.086	.079
.1	20%	CCD-104M	.906	.354	1.107	.859	.705	.647	.05	20%	TCP-R05	.625	.375	.146	.113	.093	.085
12 VOLT									.1	+80-20	TCP-R1	.725	.375	.198	.153	.126	.115
.1	+80-20	Y5S-104Z	.315	.250	.178	.138	.113	.104									
.1	+80-20	TCO-104Z	.354	.250	.115	.089	.073	.067									
.22	+80-20	TCO-224Z	.512	.250	.223	.173	.142	.131									
.47	+80-20	TCO-474Z	.610	.375	.495	.385	.315	.289									
16 VOLT																	
.01	20%	TCL-103M	.250	.250	.112	.087	.071	.065									
.022	20%	TCL-223M	.300	.250	.115	.089	.073	.067									
.033	20%	TCL-333M	.340	.250	.123	.096	.079	.072									
.05	20%	TCL-503M	.330	.250	.169	.131	.108	.099									

T A W ELECTRONICS, INC.

4215 W. BURBANK BLVD.

BURBANK, CALIFORNIA 91505

L.A. (818) 846-3911

TELEX : 71-3718354

F.O.B. BURBANK, CALIFORNIA

NO. CA. (408) 738-1795

TWX : 310-3718354

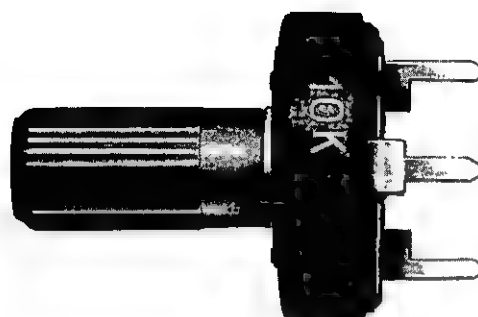
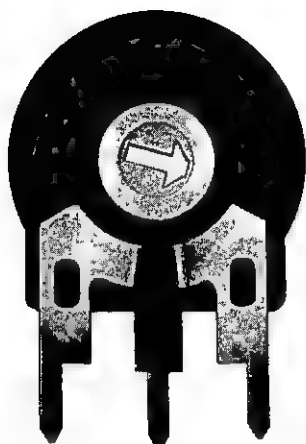
PRICES SUBJECT TO CHANGE WITHOUT NOTICE

OUT CA. (800) 255-9538

TERMS NET 30 DAYS



PIHER CERMET POTENTIOMETERS SERIES PTC 10 / PTC 15



ELECTRICAL CHARACTERISTICS:		PTC 10	PTC 15
Nominal values range (Rn)		100 220 470 1K 2.2K 4.7K 10K 22K 47K 100K 220K 470K 1M ≥50Ω to <100Ω and >1MΩ to ≤5MΩ upon request	
Tolerance		±20% (± 10% upon request)	
Power rating		.33W at 70°C .50W at 40°C	.50W at 70°C .75W at 40°C
Voltage rating		200 VDC	250 VDC
Residual resistance		<2Ω for Rn ≤2.2K .1% for Rn >2.2K	
Variation in apparent wiper resistance		2.5%	
Temperature coefficient		- 100 ppm	
Temperature range		- 55° to 125°C	
Electrical life test 1000 hours at 70 °C		ΔR≤2%	

MECHANICAL CHARACTERISTICS:		
Angle of rotation (mechanical) (electrical)	240° ± 5° 220° ± 15°	270° ± 5° 250° ± 15°
Wiper torque	.5 to 1.5 Ncm (.7 to 2.1 oz in)	.5 to 2.5 Ncm (.7 to 3.4 oz in)
Maximum applicable torque at the end stops	5 Ncm (6.8 oz in)	20 Ncm 27.2 oz in)
Thrust and pull in the spindle	9.8 N (35 oz)	25 N (90 oz)
Mechanical life	200 cycles ΔR<1%	



TAW ELECTRONICS, INC.

4215 WEST BURBANK BLVD. • BURBANK, CA 91505

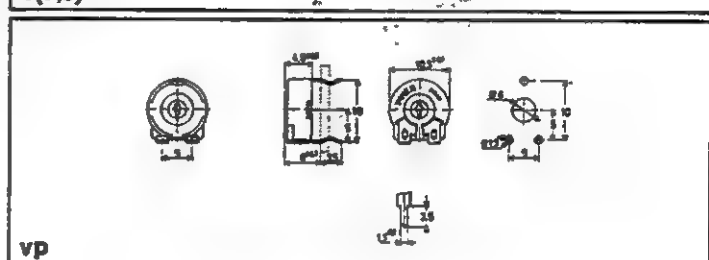
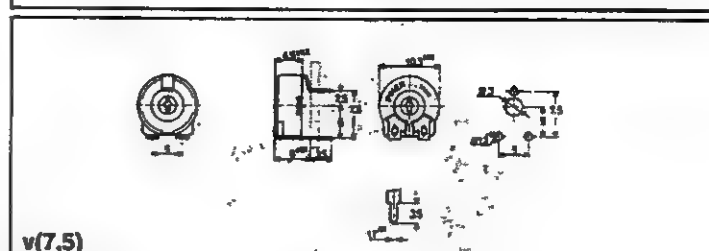
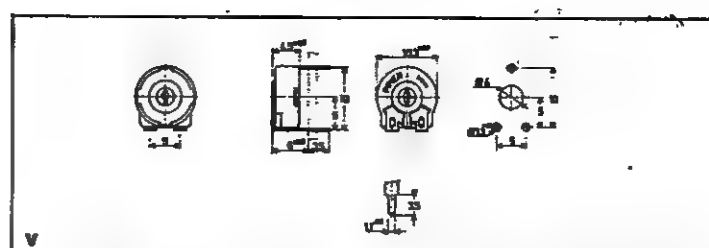
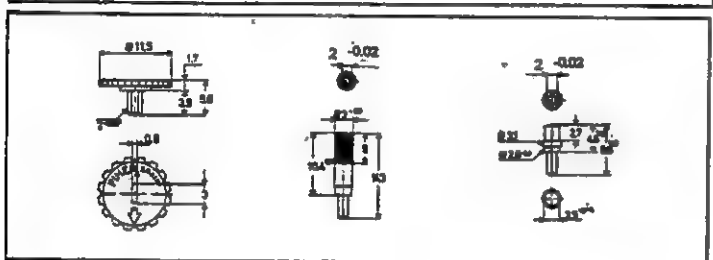
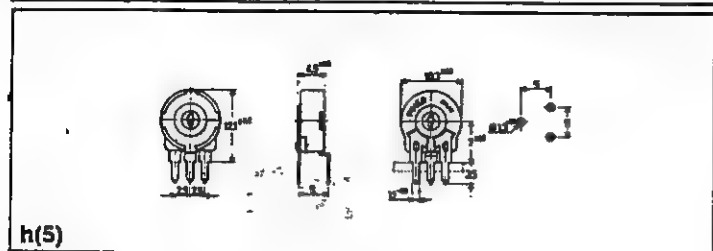
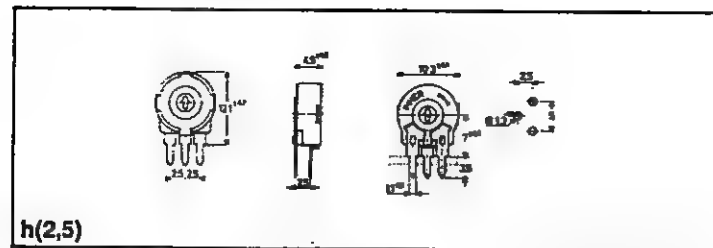
(818) 846-3911 L.A.

(408) 738-1795 Sunnyvale

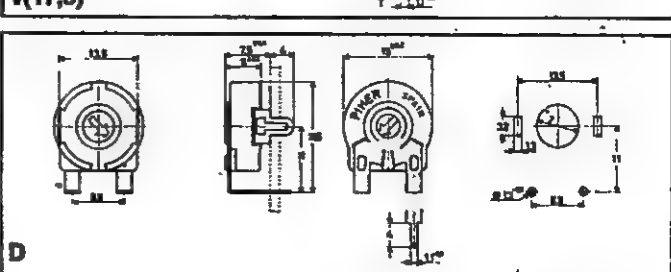
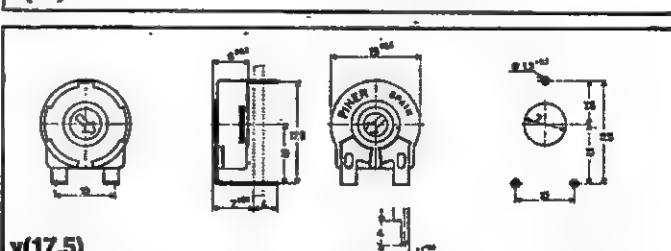
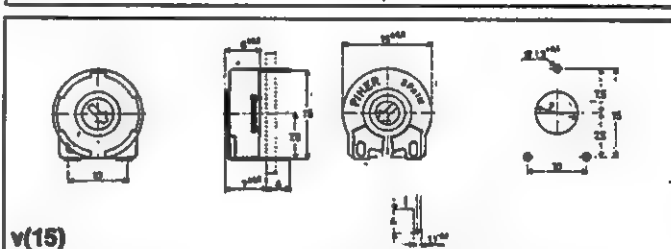
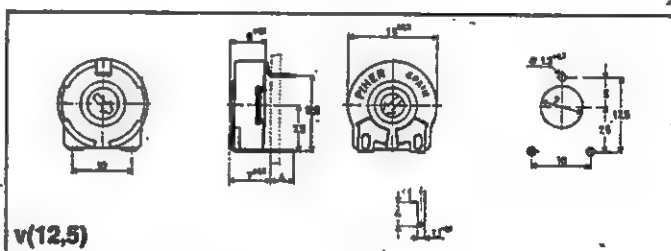
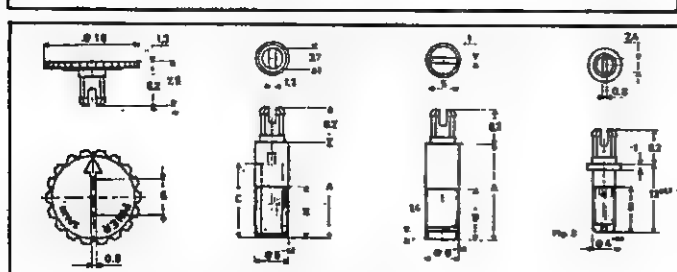
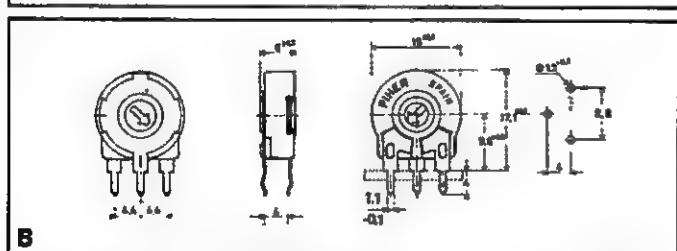
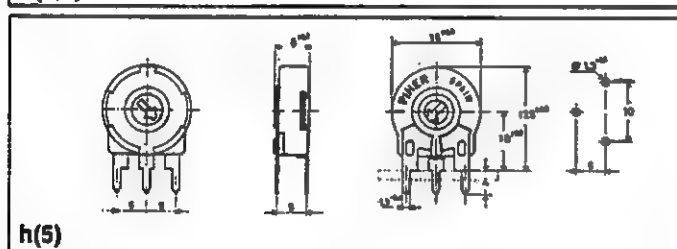
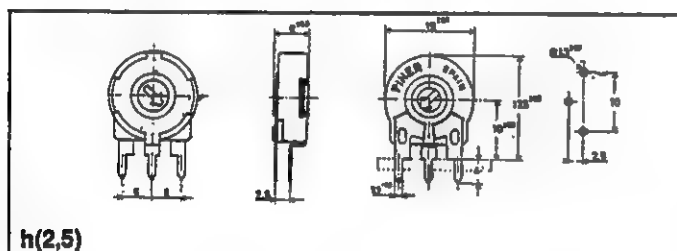
(800) 255-9538 Outside of California

Telex 71-3718354 TWX 310-3718354

PTC 10



PTC 15



DESCRIPTION		BASE PRICE	100	500	1000	5000	10000
<u>PT 10 H</u>							
PIHER PT10 H (2.5)		303.39	235.50	212.17	177.15	171.85	166.57
-----	PT 10H 100H	PT 10H 1K	PT 10H 20K	PT 10H 120K	PT 10H 500K	PT 10H 5M	
ITEM	PT 10H 200H	PT 10H 2K	PT 10H 25K	PT 10H 200K	PT 10H 1M	PT 10H 10M	
CODE	PT 10H 250H	PT 10H 2K5	PT 10H 30K	PT 10H 220K	PT 10H 1M5		
-----	PT 10H 300H	PT 10H 5K	PT 10H 50K	PT 10H 250K	PT 10H 2M		
-----	PT 10H 500H	PT 10H 10K	PT 10H 100K	PT 10H 300K	PT 10H 3M		
<u>PT 10 V</u>							
PIHER PT10 V		303.39	235.50	212.17	177.15	171.85	166.57
-----	PT 10V 100H	PT 10V 1K	PT 10V 20K	PT 10V 120K	PT 10V 1M	PT 10V 10M	
ITEM	PT 10V 200H	PT 10V 2K	PT 10V 25K	PT 10V 200K	PT 10V 1M5		
CODE	PT 10V 250H	PT 10V 2K5	PT 10V 30K	PT 10V 250K	PT 10V 2M		
-----	PT 10V 300H	PT 10V 5K	PT 10V 50K	PT 10V 300K	PT 10V 3M		
-----	PT 10V 500H	PT 10V 10K	PT 10V 100K	PT 10V 500K	PT 10V 5M		
<u>PT 10 YV</u>							
* PIHER PT10 YV		327.18	253.96	228.80	191.05	185.32	179.63
-----	PT 10 YV 100H	PT 10 YV 2K	PT 10 YV 20K	PT 10 YV 100K	PT 10 YV 300K	PT 10 YV 5M	
ITEM	PT 10 YV 250H	PT 10 YV 2K5	PT 10 YV 25K	PT 10 YV 120K	PT 10 YV 500K	PT 10 YV 10M	
CODE	PT 10 YV 500H	PT 10 YV 5K	PT 10 YV 30K	PT 10 YV 200K	PT 10 YV 1M		
-----	PT 10 YV 1K	PT 10 YV 10K	PT 10 YV 50K	PT 10 YV 250K	PT 10 YV 2M		
<u>PT 15 YB</u>							
* PIHER PT15 YB		333.13	258.58	232.96	194.52	188.69	182.89
-----	PT 15YB 100H	PT 15YB 1K	PT 15YB 10K	PT 15YB 50K	PT 15YB 250K	PT 15YB 1M5	
ITEM	PT 15YB 200H	PT 15YB 2K	PT 15YB 20K	PT 15YB 100K	PT 15YB 300K	PT 15YB 2M	
CODE	PT 15YB 250H	PT 15YB 2K5	PT 15YB 25K	PT 15YB 120K	PT 15YB 500K	PT 15YB 5M	
-----	PT 15YB 300H	PT 15YB 5K	PT 15YB 30K	PT 15YB 200K	PT 15YB 1M	PT 15YB 10M	
-----	PT 15YB 500H						
<u>PT 15 YD</u>							
* PIHER PT15 YD		333.13	258.58	232.96	194.52	188.69	182.89
-----	PT 15YD 100H	PT 15YD 1K	PT 15YD 20K	PT 15YD 100K	PT 15YD 300K	PT 15YD 2M	
ITEM	PT 15YD 200H	PT 15YD 2K	PT 15YD 25K	PT 15YD 120K	PT 15YD 500K	PT 15YD 3M	
CODE	PT 15YD 250H	PT 15YD 2K5	PT 15YD 30K	PT 15YD 200K	PT 15YD 1M	PT 15YD 5M	
-----	PT 15YD 300H	PT 15YD 5K	PT 15YD 50K	PT 15YD 250K	PT 15YD 1M5	PT 15YD 10M	
-----	PT 15YD 500H	PT 15YD 10K					
<u>PTC 10 V CERMET</u>							
PIHER CERMET PTC 10V		383.70	297.83	244.19	232.11	224.05	203.94
-----	PTC 10V 100H	PTC 10V 1K	PTC 10V 4.7K	PTC 10V 22K	PTC 10V 100K	PTC 10V 470K	
ITEM	PTC 10V 220H	PTC 10V 2K	PTC 10V 5K	PTC 10V 47K	PTC 10V 220K	PTC 10V 1M	
CODE	PTC 10V 470H	PTC 10V 2.2K	PTC 10V 10K	PTC 10V 50K			

<u>PTC 10 H CERMET</u>							
PIHER CERMET PTC 10H		383.70	297.83	244.19	232.11	224.05	203.94
-----	PTC 10H 100H	PTC 10H 1K	PTC 10H 4.7K	PTC 10H 22K	PTC 10H 100K	PTC 10H 470K	
ITEM	PTC 10H 220H	PTC 10H 2K	PTC 10H 5K	PTC 10H 47K	PTC 10H 220K	PTC 10H 1M	
CODE	PTC 10H 470H	PTC 10H 2.2K	PTC 10H 10K	PTC 10H 50K			

THUMBWHEELS		89.00	69.09	56.64	53.84	51.97	47.31
SPINDLE SHAFTS		100.00	77.62	63.64	60.49	58.39	53.15

*WITH THUMBWHEELS

T A W ELECTRONICS, INC.

4215 W. BURBANK BLVD.

BURBANK, CALIFORNIA 91505

L.A. [213] 848-3811

TELEX : 71-3718354

F.O.B. BURBANK, CALIFORNIA

NO. CA. [408] 738-1785

TWX : 310-3718354

PRICES SUBJECT TO CHANGE WITHOUT NOTICE

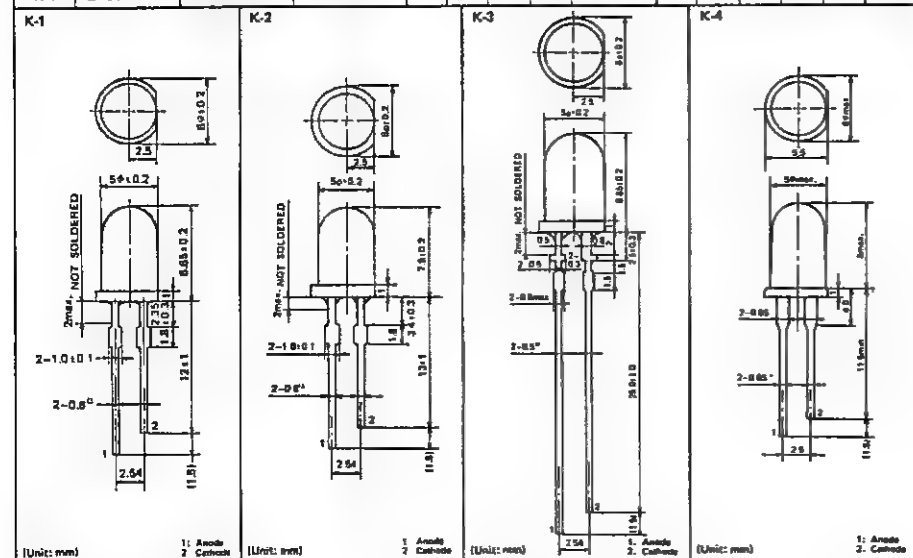
OUT CA. [800] 255-9538

TERMS

NET 30 DAYS

POINT LIGHT SOURCE ROUND TYPE (50 SERIES)

Package	Type No.	Radiation Color & Material	Lens Dimension	Absolute Maximum Ratings (Ta=25°C)					Electro-Optical Characteristics (Ta=25°C)					
				V _R	I _F	I _{FM}	P _D	T _{OP}	I _O typ. (mcd)	V _F typ. (V)	I _R max. (μA)	Ap typ. (A)		
				(V)	(mA)	(mA)	(mW)	(°C)						
K-1	LN21RP.HL	Red GaP	Red Diffused	4	25	30	70	-25 ~ +85	15	2.0	20	2.1	5	7,000
K-1	LN21RCP.HL	Red GaP	Red Clear	4	25	30	70	-25 ~ +85	15	5.0	20	2.1	5	7,000
K-1	LN21WP.HL	Red GaP	White Diffused	4	25	30	70	-25 ~ +85	15	3.0	20	2.1	5	7,000
K-1	LN21CP.HL	Red GaP	Clear	4	25	30	70	-25 ~ +85	15	5.0	20	2.1	5	7,000
K-1	LN31GP.HL	Green GaP	Green Diffused	4	30	40	90	-25 ~ +85	20	15.0	20	2.2	5	5,650
K-1	LN31GCP.HL	Green GaP	Green Clear	4	30	40	90	-25 ~ +85	20	20.0	20	2.2	5	5,650
K-1	LN41YP.HL	Amber GaAsP	Amber Diffused	4	30	40	90	-25 ~ +85	20	8.0	20	2.1	10	5,900
K-1	LN41YCP.HL	Amber GaAsP	Amber Clear	4	30	40	90	-25 ~ +85	20	20.0	20	2.1	10	5,900
K-1	LN81RP.HL	Orange GaAsP	Red Diffused	3	30	40	90	-25 ~ +85	20	10.0	20	2.1	10	6,300
K-1	LN81RCP.HL	Orange GaAsP	Red Clear	3	30	40	90	-25 ~ +85	20	15.0	20	2.1	10	6,300
K-1	LN81CP.HL	Orange GaAsP	Clear	3	30	40	90	-25 ~ +85	20	20.0	20	2.1	10	6,300
K-2	LN21RP.SL	Red GaP	Red Diffused	4	25	30	70	-25 ~ +85	15	2.0	20	2.1	5	7,000
K-2	LN21RCP.SL	Red GaP	Red Clear	4	25	30	70	-25 ~ +85	15	5.0	20	2.1	5	7,000
K-2	LN21CP.SL	Red GaP	Clear	4	25	30	70	-25 ~ +85	15	5.0	20	2.1	5	7,000
K-2	LN31GP.SL	Green GaP	Green Diffused	4	30	40	90	-25 ~ +85	20	15.0	20	2.2	10	5,650
K-2	LN41YP.SL	Amber GaAsP	Amber Diffused	4	30	40	90	-25 ~ +85	20	8.0	20	2.1	10	5,900
K-3	LN21RP.H	Red GaP	Red Diffused	4	25	30	70	-25 ~ +85	15	2.0	20	2.1	5	7,000
K-3	LN21RCP.H	Red GaP	Red Clear	4	25	30	70	-25 ~ +85	15	5.0	20	2.1	5	7,000
K-3	LN21WP.H	Red GaP	White Diffused	4	25	30	70	-25 ~ +85	15	3.0	20	2.1	5	7,000
K-3	LN21CP.H	Red GaP	Clear	4	25	30	70	-25 ~ +85	15	5.0	20	2.1	5	7,000
K-3	LN31GP.H	Green GaP	Green Diffused	4	30	40	90	-25 ~ +85	15	15.0	20	2.2	10	5,650
K-3	LN31GCP.H	Green GaP	Green Clear	4	30	40	90	-25 ~ +85	15	20.0	20	2.2	10	5,650
K-3	LN41YP.H	Amber GaAsP	Amber Diffused	4	30	40	90	-25 ~ +85	15	8.0	20	2.1	10	5,900
K-4	LN21	Red GaAsP	Red Diffused	3	55	80	130	-25 ~ +85	20	1.5	30	1.75	10	6,600
K-4	LN21W	Red GaAsP	White Diffused	3	55	80	130	-25 ~ +85	20	1.5	30	1.75	10	6,600
K-4	LN31	Green GaP	Green Diffused	4	30	40	90	-25 ~ +85	20	2.0	20	2.2	10	5,650



Δ Preliminary

STOCKING DISTRIBUTOR

TW TAW ELECTRONICS, INC.
4215 WEST BURBANK BLVD. • BURBANK, CA 91505

NOTE

The visible-light emitting diode can be handled as same as other general use semiconductors, however following notes should be carefully taken by considering a opto-electric characteristics.

1. Temperature Resistance

- Temperature exceeding absolute maximum rating (T_{stg}) should not applied to the resin.
- Soldering works should be performed in 3 seconds under 260°C, 2 mm away from the resin.
- Soldering iron should be operated under 30W power consumptions.

2. Chemicals Resistance

Organic solvent like an acetone should not be used as it might cause a damage to the device. Washing should be performed in 30 seconds under 45°C using below chemicals.

Point light source:
Alcohol, Chlorosene, Fieon TF, Hexan
Numerical Display/Level Meter:
Fieon TF, Hexan

- Should be used under 25°C.

3. Abrasion Resistance

Some of the devices are made of resin with low-hardness characteristics, therefore they might be damaged when scratched by metal, nail and sand-blast.

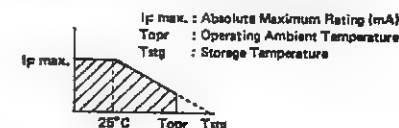
4. Lead Wire Stresses

- Lead forming should be performed not to make any stresses to the device.
- When the device is mounted into printed circuit

board, pitch spacing should be carefully aligned not to cause any stresses to the lead wires. Otherwise the stress will cause the trouble to the device in a high temperature operation. Three minutes are necessary for the device to return to normal temperature after the solder operation.

5. Operating Current at High Temperature

When ambient temperature exceeds 25°C, absolute maximum current decreases. Device should be operated in the oblique lined area.



6. Filter

When the filter's transmittivity is not matched with lighting color, luminous intensity decreases remarkably. Same colored filter should be used.

7. Excess Current

Protection resistor should be applied to protect against excess current.

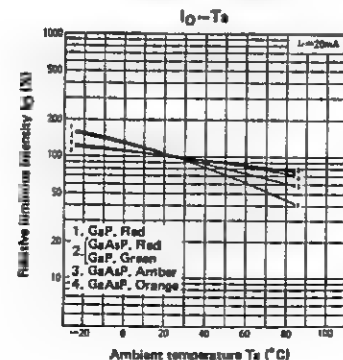
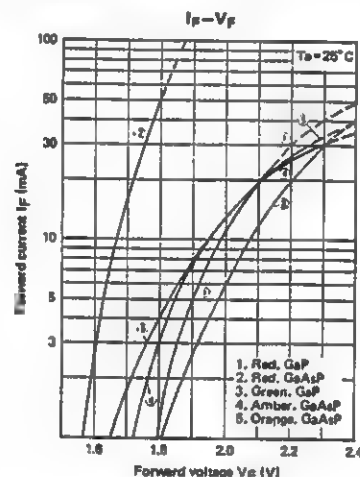
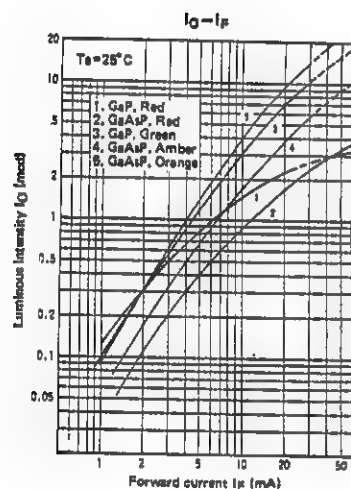
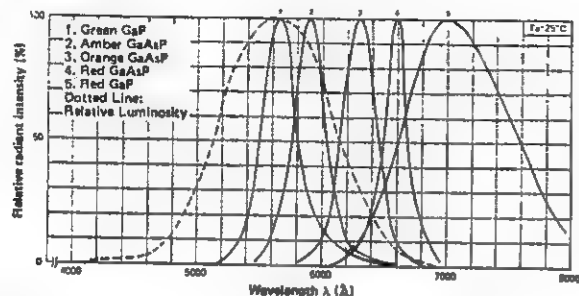
MOUNTING ACCESSORY (LED HOLDER, LED SPACER)

Type No.	LED Holder		LED Spacer	
	KL-01	KL-02	KL-03	KL-04
Materials	Chloroprene Rubber	Epoxy resin	Epoxy resin	Epoxy resin
LED Package No.	5p Type (K-1, K-2, K-3, K-4)	3p Type (K-5, K-7, K-8, K-9)	5p Type (K-1, K-2, K-3, K-4)	4p, 5p Type (K-1, K-2, K-3, K-4, K-5, K-6, K-7, K-8, K-9, K-10)
Out Line Drawings				

TYPICAL CHARACTERISTIC CURVES

Devices with same color (same chip in most cases) have similar opto-electric characteristics except I_O vs I_F . Curves below are for 5p HL series as an example.

Relative Spectral Characteristics



LETTER SYMBOLS

I_F : Forward DC Current	I_O : Luminous Intensity
I_{FM} : Peak Forward Current	$I_{O(DP)}$: Luminous Intensity of Decimal Point
I_{FP} : Peak Forward Current (Pulse) (Duty 1/10 Pulse Width 1msec.)	$I_{O(seg)}$: Luminous Intensity of Segment
I_R : Reverse Leakage Current, Dark Current	λ_P : Peak Emission Wavelength
V_F : Forward DC Voltage	T_a : Ambient Temperature
V_R : Reverse Voltage	T_{opr} : Operating Ambient Temperature
P_D : Power Dissipation	T_{stg} : Storage Temperature

MATERIALS OF THE VISIBLE-LIGHT-EMITTING DIODES

Materials of the visible-light-emitting diodes by Matsushita Electronic Corporation consist of gallium phosphide (GaP) and gallium arsenide phosphide providing opto-electrical characteristics listed below.

Color	Materials	Wavelength at Peak Emission (Å)	Spectral Bandwidth between Half-Power Points (Å)	Static Forward Voltage (V)	Junction
Red	GaP:Zn,O	7,000	1,000	2.1	Solution-Grown
Green	GaP:N	5,650	300	2.2	Solution-Grown
Red	GaAs _{0.6} P _{0.4}	6,600	200	1.75	Diffusion
Amber	GaAs _{0.15} P _{0.85} N	6,900	300	2.1	Diffusion
Orange	GaAs _{0.35} P _{0.65} N	6,300	400	2.1	Diffusion

The GaAsP light-emitting diode is a gaseous phased Pn junction of GaAs_{1-x}P_x layer isolated by Zn diffused Epitaxial formation on the N-type GaAs or GaP substrate. Many variety of lighting colors, as shown in above list table, are obtained by changing As and P concentration ratio. GaP light emitting diode is produced by forming a N and P type epitaxial layer using solution-grown method on the N-type GaP substrate. Lighting color depends on doping impurities, and red color is gained by Zn-O dope and green by N-type dope.

The light derived from near Pn junction can be obtained efficiently out of the device as GaP is a transparent material. Especially GaP (red) light emitting diode provides us high luminance at low current, which is suitably used for D.C. low current applications such as battery operated products as the luminance is apt to saturate in the area of high current as shown in the relative spectral characteristics. GaP (green) and GaAsP light emitting diode is suitably applied for pulse driver applications as the luminance can be gained in proportion to current.

UNITS OF RADIATION

1) Luminous flux (lm, lumen)

The time rate of flow of light. Luminous flux is related to radiant flux by the eye-response curve.

2) Luminous Intensity (cd, Candela)

Luminous intensity in the perpendicular direction, of a surface of 1/60 square centimeter of a black body at the temperature of melting point 2042°K.

3) Luminance B (fL, Foot Lambert)

The luminous intensity of a surface in a given direction per unit of projected area of the surface as viewed from that direction.

CODE DEFINITION:

A = DIRECT EQUIVALENT

B = MINOR ELECTRICAL OR MECHANICAL DIFFERENCE

CROSS REFERENCE GUIDE

LITRONIX

GENERAL INSTRUMENT

LED 7 - SEGMENT DISPLAYS

LITRONIX

COMPETITOR	PANASONIC	CODE	COMPETITOR	PANASONIC	CODE
CQX13-1	LN31GPHL	B	MV5020	LN21CPHL	A
CQX13-2	LN31GPHL	B	MV5021	LN21RCPHL	A
CQX23-1	LN21RPHL	B	MV5022	LN21RCPHL	A
CQX23-2	LN21RPHL	B	MV5023	LN21RPHL	A
CQX33-1	LN41YPHL	B	MV5024	LN21RCPHL	A
CQX33-2	LN41YPHL	B	MV5025	LN21RPHL	A
GL211	LN38GP	A	MV5026	LN21RPHL	A
GL4484	LN38GP	A	MV5050	LN21CPH	A
GL4850	LN31GPH	A	MV5052	LN21RPH	A
GL4950	LN31GPH	A	MV5053	LN21RCPH	A
LD30A	LN28RP	A	MV5054-1	LN21RPH	A
LD30-1	LN28RP	A	MV5054-2	LN21RPH	A
LD30-2	LN28RP	B	MV5054-3	LN21RPH	A
LD30-3	LN28RP	B	MV5055	LN21RPH	A
LD30-C	LN28CP	A	MV5056	LN21RPH	A
LD32C	LN28RCP	A	MV5074B	LN28RP	A
LD32-1	LN28RP	B	MV5074C	LN28RP	A
LD32-2	LN28RP	B	MV5075B	LN28RP	A
LD36A	LN48YP	A	MV5075C	LN28RP	A
LD36C	LN48YCP	A	MV5094	LN21RAHL	A
LD36-1	LN48YP	A	MV5152	LN81CPH	B
LD36-2	LN48YP	A	MV5153	LN81RPH	A
LD37A	LN38GP	A	MV5154	LN81RCPH	A
LD37C	LN38YCP	B	MV5152	LN31GCPH	A
LD37-1	LN38GP	A	MV3253	LN31GPH	A
LD37-2	LN38GP	B	MV5254	LN31GCPH	A
LD41A	LN21RPHL	A	MV5274B	LN38GP	A
LD41-1	LN21RPHL	A	MV5274C	LN38GP	A
LD41-2	LN21RPHL	A	MV5352	LN41YCPH	B
LD50A	LN21RPHL	A	MV5353	LN41YPH	A
LD50-1	LN21RPHL	A	MV5354	LN41YCPH	A
LD50-2	LN21RPHL	B	MV5374B	LN48YP	A
LD52C	LN21RCPHL	B	MV5374C	LN48YP	A
LD52CA	LN21RCPHL	B	MV5752	LN21CAL/LN8B	B
LD52-1	LN21RPHL	A	MV5753	LN81RPH	A
LD52-2	LN21RPHL	B	MV5754	LN81RCPH	A
LD56A	LN41YPHL	A	MV5774B	LN28RP	A
LD56C	LN41YCPHL	A	MV5774C	LN28RC	A
LD56CA	LN41YCPHL	A			
LD56-1	LN41YPHL	A			
LD56-2	LN41YPHL	A			
LD57A	LN31GPHL	A			
LD57C	LN31GCPHL	A			
LD57CA	LN31GCPHL	A			
LD57-1	LN31GPHL	B			
LD57-2	LN31GPHL	B			
LD80A	LN219RP	B			
LD80-1	LN219RP	B			
LD80-2	LN219RP	B			
LD82A	LN219RP	B			
LD82-1	LN219RP	B			
LD82-2	LN219RP	B			
LD86A	LN419YP	B			
LD86-1	LN419YP	B			
LD86-2	LN419YP	B			
LD87A	LN319GP	B			
LD87-1	LN319GP	B			
LD87-2	LN319GP	B			
OL30-3	LN81RPHL	A			
OL30-6	LN81RPHL	A			
OD30-30-3	LN81RPH	A			
OL30-30-6	LN81RPH	A			
RL-2	LN29RP	A			
RL-209A	LN28RP	B			
RL209-1	LN28RP	B			
RL209-2	LN28RP	B			
RL2000	LN21RPH	A			
RL4403	LN21RPH	A			
RL4480	LN28RP	B			
RL4480-1	LN28RP	B			
RL4480-2	LN28RP	B			
RL4480-5	LN28RP	B			
RL-4484	LN28RP	B			
RL-4850	LN21RPH	A			
RL-5054-1	LN21RPH	A			
RL-5054-2	LN21RPH	A			
RL-5054-5	LN21RPH	A			
RLT-1	LN23SRP (H) B	B			
YL212	LN48YP	B			
YL4484	LN48Y%	B			
YL4550	LN41YPH	A			
YL4850	LN41YRH	A			

HEWLETT PACKARD

COMPETITOR	PANASONIC	CODE
HLMP-1300	LN28RA or LN28RP	B
HLMP-1301	LN28RA or LN28RP	B
HLMP-1302	LN28RA or LN28RP	B
HLMP-1400	LN48YP	B
HLMP-1401	LN48YP	B
HLMP-1402	LN48YP	B
HLMP-1500	LN38GP	B
HLMP-1501	LN38GP	B
HLMP-1502	LN38GP	B
5082-4480	LN28RA or LN28RP	B
5082-4483	LN28WP	B
5082-4484	LN28RA or LN28RP	B
5082-4486	LN28RCP	B
5082-4487	LN28RCP	B
5082-4488	LN28RCP	B
5082-4494	LN28RA or LN28RP	A
5082-4550	LN41YPH	A
5082-4555	LN41YPH	A
5082-4557	LN41YCPH	A
5082-4558	LN41YCPH	A
5082-4650	LN81RPH	A
5082-4655	LN81RPH	A
5082-4657	LN81RCPH	A
5082-4658	LN81RCPH	B
5082-4690	LN81RPH	B
5082-4693	LN81RPH	B
5082-4694	LN81RCPH	B
5082-4695	LN81RCPH	A
5082-4850	LN21RPH	A
5082-4855	LN21RPH	B
5082-4880	LN21RPHL	B
5082-4881	LN21RPHL	B
5082-4882	LN21RPHL	B
5082-4883	LN21CPHL	B
5082-4884	LN21CPHL	B
5082-4885	LN21CPHL	A
5082-4950	LN31GPH	A
5082-4955	LN31GPH	A
5082-4957	LN31GCPH	A
5082-4958		

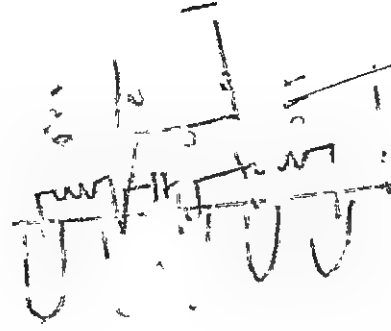
COMPETITOR	PANASONIC	CODE
DL-500	LN516RK	A
DL-507	LN516RA	A
DL-527	LN526RA	A
DL-528	LN526RK	A
DL-704	LN513RK	B
DL-707R	LN513RA	B
DL-727	LN526RA	A
DL-728	LN526RK	A
DL-4770	LN543RA/RK	B
DL-7731	LN513RA	A
DL-7734	LN513RK	B
DL-7740	LN513RK	B
DL-7751	LN514RA	A
DL-7760	LN514RK	A
DLG-7671	LN514RA	A
DLG-7673	LN514RK	A
DLO-500	LN516RK	A
DLO-507	LN516RA	A
DLO-527	LN526RA	A
DLO-528	LN526RK	A
DLO-4770	LN543RA/RK	B
DLO-7611	LN513RA	A
DLO-7613	LN513RK	B
DLO-7614	LN513RK	B
DLO-7651	LN514RA	A
DLO-7653	LN514RK	A
DLY-7661	LN514RA	A
DLY-7663	LN514RK	A

GENERAL INSTRUMENT

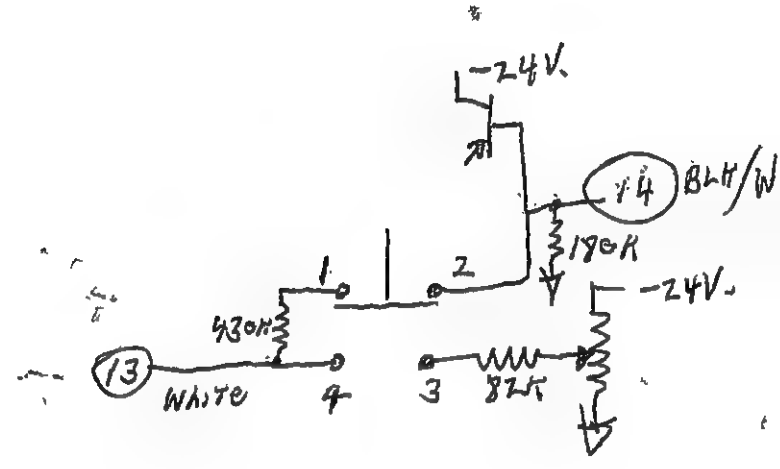
COMPETITOR	PANASONIC	CODE
MAN51A	LN513GA	A
MAN43A	LN513GK	B
MAN71A	LN513RA	A
MAN74A	LN513RK	B
MAN81A	LN513YA	A
MAN84A	LN513YK	B
MAN3610A	LN5130A	A
MAN3640A	LN5130K	B
MAN4510	LN514GA	A
MAN4540	LN514GK	B
MAN4610	LN5140A	A
MAN4640	LN5140K	B
MAN4710	LN514RA	A
MAN4740	LN514RK	B
MAN4810	LN514YA	A
MAN4840	LN514YK	B
MAN6610	LN5260A	A
MAN6640	LN5260K	A
MAN6660	LN5160A	A
MAN6680	LN5160K	A
MAN6710	LN526RA	A
MAN6740	LN526RK	A
MAN6760	LN516RA	A
MAN6780	LN516RK	A

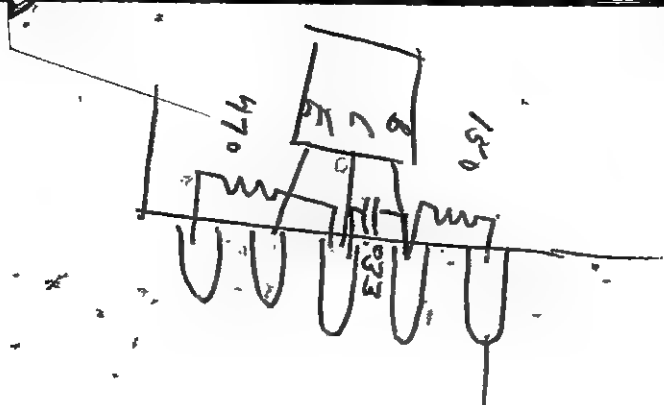
HEWLETT PACKARD

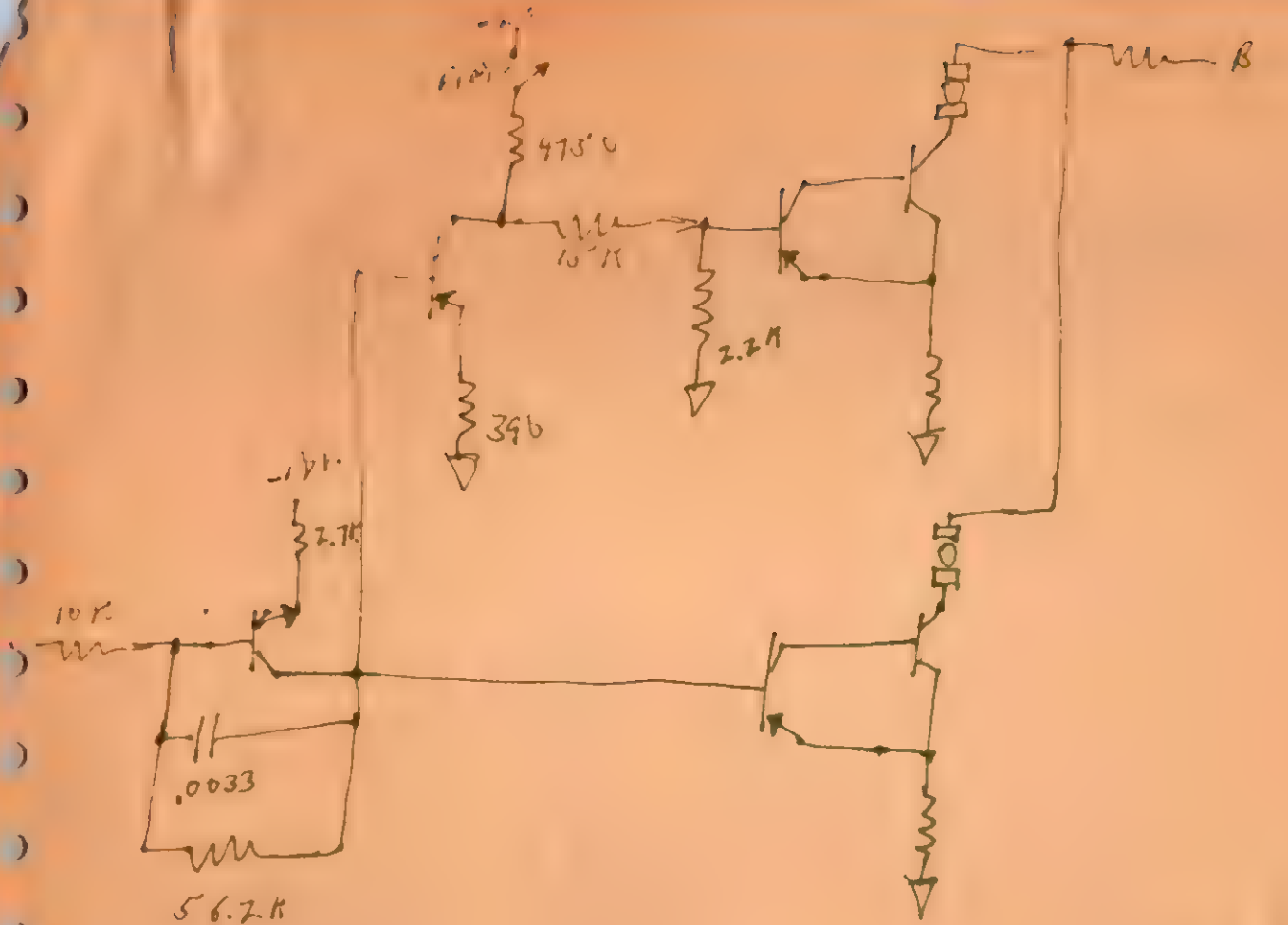
COMPETITOR	PANASONIC	CODE
HDSP-3531	LN513RA	A
HDSP-3533	LN513RK	B
HDSP-3731	LN514RA	A
HDSP-3733	LN514RK	A
HDSP-4031	LN513YA	A
HDSP-4033	LN513YK	B
HDSP-4131	LN514YA	A
HDSP-4133	LN514YK	A
HDSP-7611	LN513RA	A
HDSP-7613	LN513RK	B
HDSP-7621	LN513YA	A
HDSP-7623	LN513YK	B
HDSP-7631	LN513GA	A
HDSP-7633	LN513GK	B
HDSP-7651	LN514RA	A
HDSP-7653	LN514RK	A
HDSP-7661	LN514YA	A
HDSP-7663	LN514YK	A
HDSP-7671	LN514GA	A
HDSP-7673	LN514GK	A
HDSP-7731	LN513RA	A
HDSP-7740	LN513RK	B
HDSP-7751	LN514RA	A
HDSP-7760	LN514RK	A



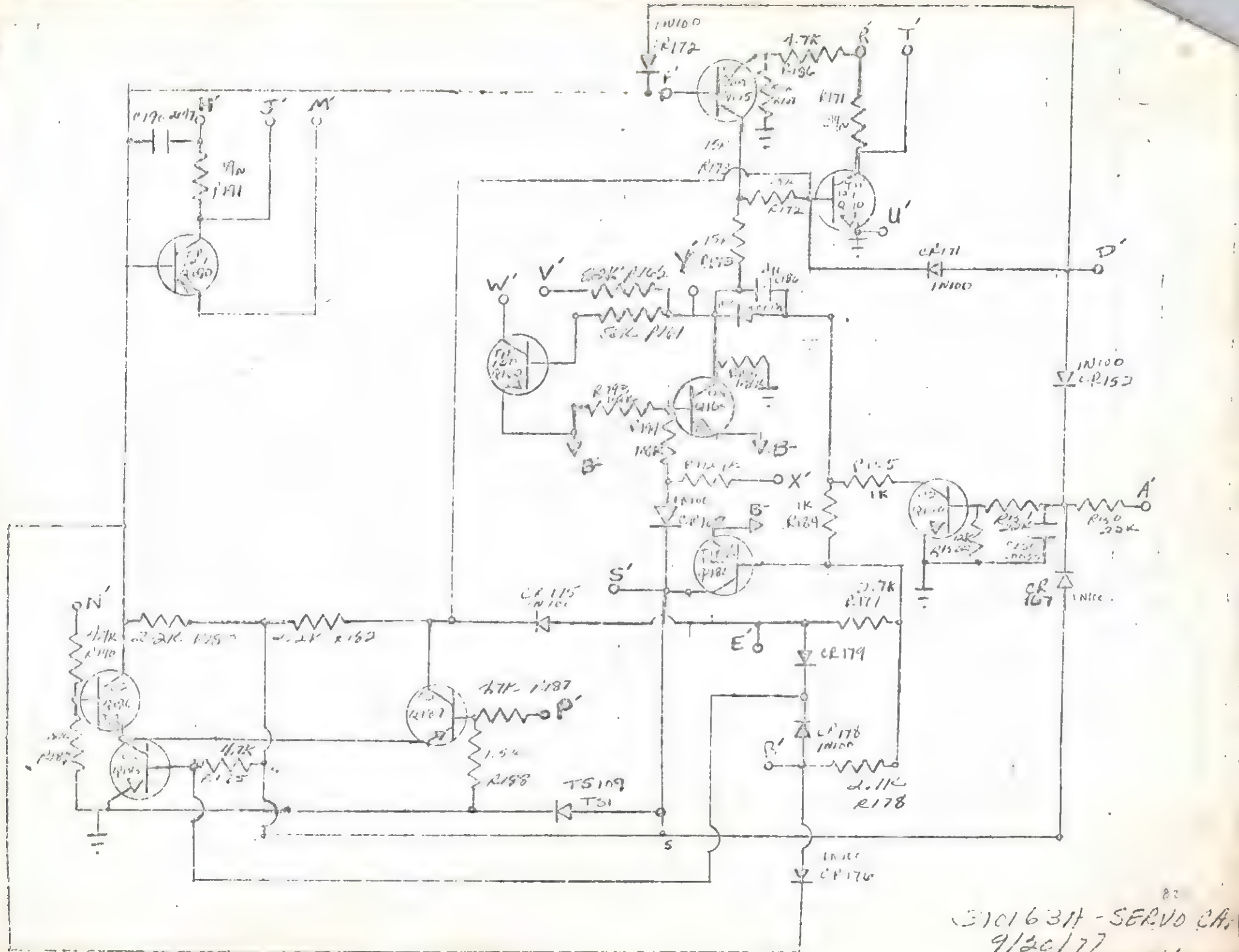
WESTLINK
 818-768-7333

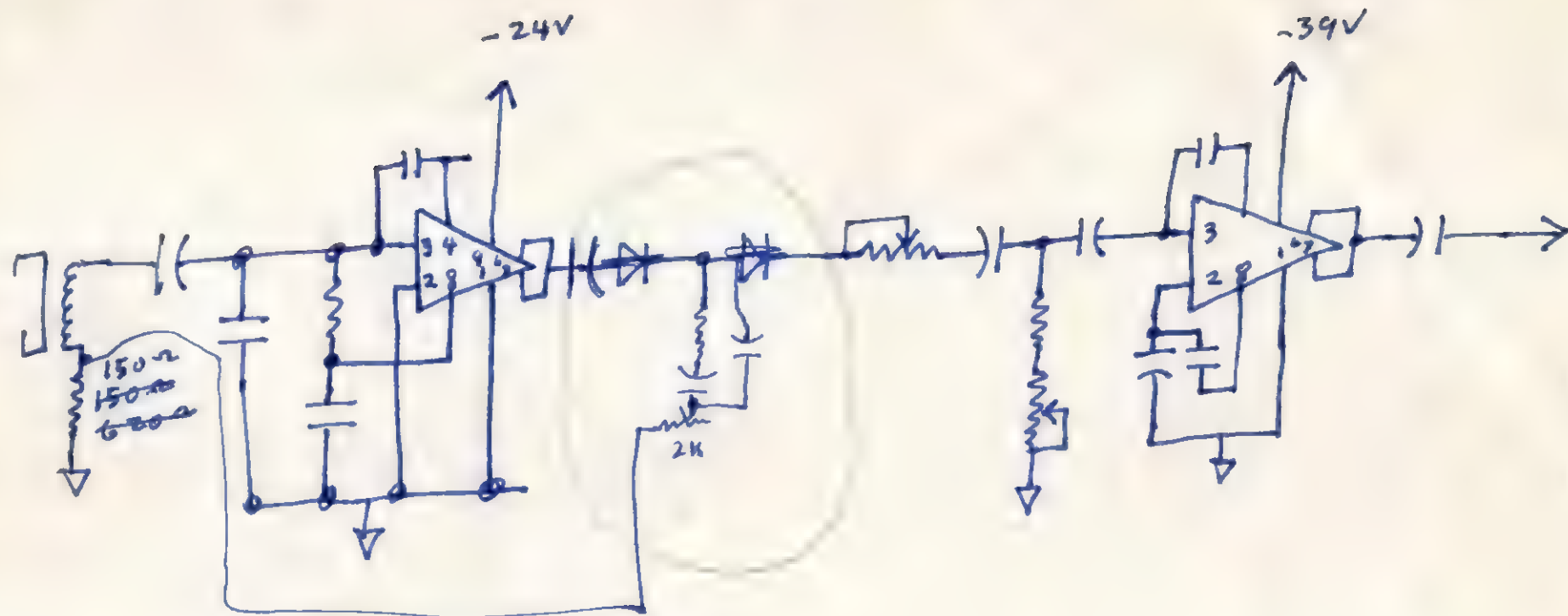






0000	START	CALL	CLRBF	;CLEAR THE INPUT BUFFER
0010		CALL	INPUT	;GET DATA FROM MACHINE
0020		CALL	MEGA1	;CHECK FOR BAD READ
0030		CALL	SCALE	;SCALE DOWN DATA TO FIT 8 BITS
0040		CALL	ZERCK	;ELIMINATE SPUIOUS ZERO COUNTS
0050		CALL	MEGA2	;CHECK FOR BAD READ
0060		CALL	FOFO	;CONVERT DATA TO PEADABLE FORM
0070		CALL	NEGATE	
0080		PET		
0090	SCALE	LXI	H,BUFFER-2	;LOAD THE ADDRESS OF BUFFER
0100	SCAL1	LXI	D,BUFEND-2	;MODIFIED END OF BUFFER ADDRESS
0110		MOV	A,H	;GET THE HIGH ORDER COUNT
0120		CMP	D	;SEE IF WERE THROUGH
0130		JNZ	SCAL2	;IF NOT, KEEP SCALING DOWN
0140		MOV	A,L	;GET THE LOW ORDER COUNT
0150		CMP	E	;SEE IF WERE THROUGH
0160		JNZ	SCAL2	;IF NOT, KEEP SCALING DOWN
0170		XRA	A	;CLEAR ACCUMULATOP AND CY FLAG
0180		PET		;ALL DONE SCALING
0190	SCAL2	INX	H	
0200		INX	H	;GET BYTE FROM MEMORY
0210		MOV	A,M	;PUT HIGH ORDER IN A
0220		ANI	OFFH	;SEE IF ANYTHINGS THERE
0230		JNZ	DIVALL	;IF SO, DIVIDE BUFFFFER LOCATIONS BY 2
0240		JMP	SCAL1	;IF NOT HERE, CHECK ALL OTHER LOCATIONS
0250	DIVALL	LXI	H,BUFFER	;LOAD THE STARTING ADDRES OF BUFFER
0260	DIVA1	LXI	D,BUFEND	;LOAD THE END ADDRES OF BUFFER
0270		MOV	A,H	;GET THE HIGH ORDER COUNT
0280		CMP	D	;SEE IF WERE THRU
0290		JNZ	DIVA2	;IF NOT KEEP DIVIDING
0300		MOV	A,L	;GET THE LOAD ORDER COUNT



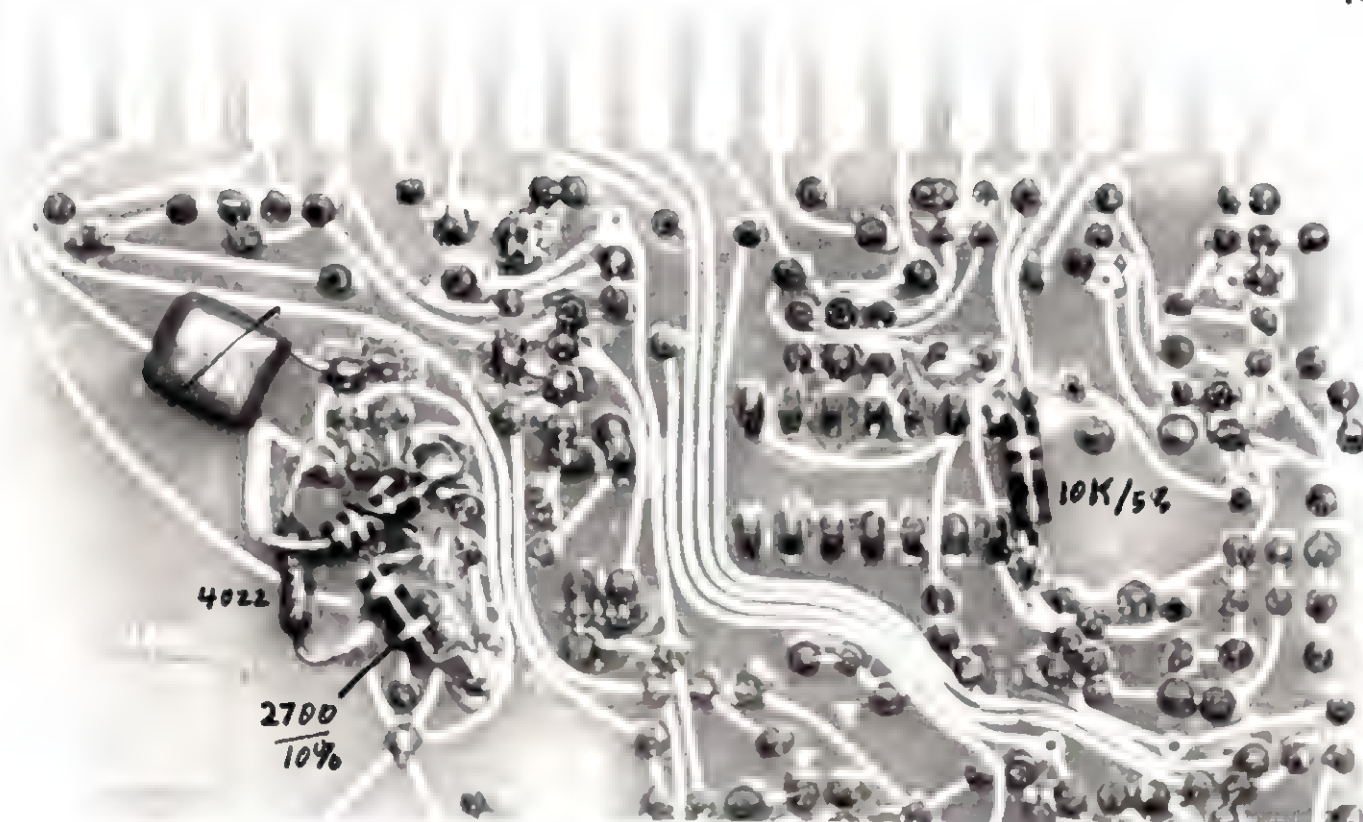


LEFT BOARD

PRINT IS
BACK ASSWARDS

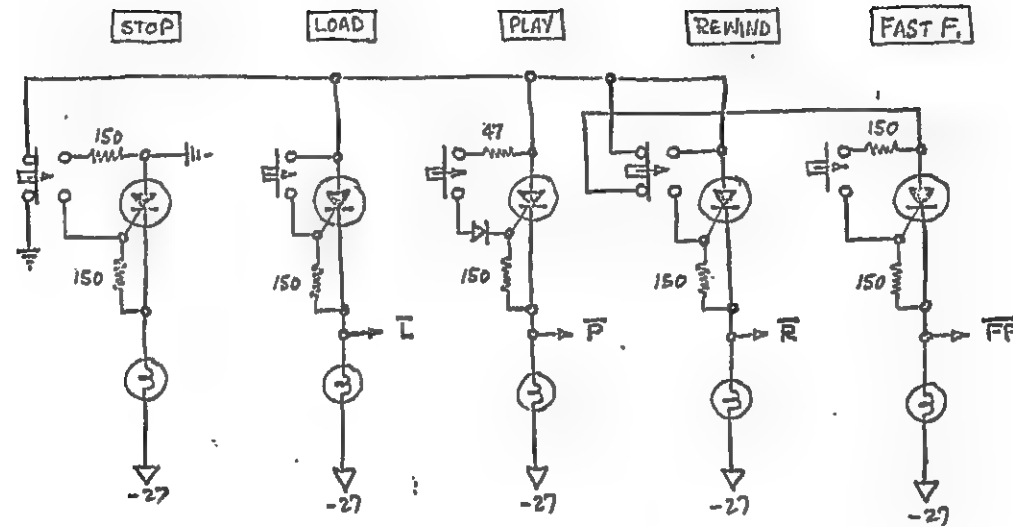
Z

A



SIMPLIFIED CONTROL SCHEMATIC

* COMMUTATING CAPS NOT SHOWN



BTX SHADOW SOFTWARE #RN080781DC

INPUT PORT ADDRESSES

BIT	5400	5401	5402	5403
	PA	PB	PC	CONT
7	SLOW SLEW	NC		
6	CHASE EN	NC	SLAVE	
5	4500 MODE	NC	MASTER	
4	VIDEO MODE	NC		
3	AUTO/FRAME	NC		
2	SLAVE EN	NC	M SHUTTLE	
1	KEYBOARD?	NC	S PAUSE TALLY	
0	?	VIDEO PULSE	M PAUSE TALLY	

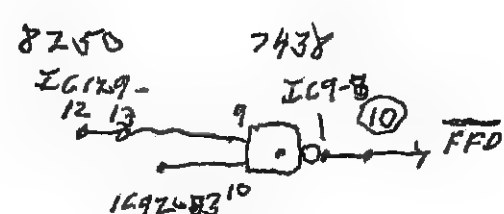
	5800	5801	5802	5803
7				
6				
5			CHASE LED ON	
4				
3				
2				
1	CHASING LED ON	24 FR		
0	S EN LED ON	25 FR		

TAK ϕ BKFD DD
 566704 1,2,3,5,7,9

DLV ✓
 FHV ✓
 UEV ✓
 HEV ✓
 HM ✓

CADDEMS

393
 407
 418



BTX SHADOW SOFTWARE #RN080781DC

INPUT PORT ADDRESSES

BIT	5400	5401	5402	5403
	PA	PB	PC	CONT
7	SLOW SLEW	NC		
6	CHASE EN	NC	SLAVE	
5	4500 MODE	NC	MASTER	
4	VIDEO MODE	NC		
3	AUTO/FRAME	NC		
2	SLAVE EN	NC	M SHUTTLE	
1	KEYBOARD?	NC	S PAUSE TALLY	
0	?	VIDEO PULSE	M PAUSE TALLY	
	5800	5801	5802	5803
7				
6				
5				
4			CHASE LED ON	
3				
2				
1	CHASING LED ON	24 FR		
0	S EN LED ON	25 FR		

1/6 * CAS² TUES - 4:00 PM
 DR. SUSSEX
 2730 WILSON SUITE 400
 HARVARD X 51
 187A

ELECTRICAL TEST SHEET

[illegible]

11-24-16

John Stephens

P.O. Box 801871

Santa Clarita CA 91380

This is a statement of my agreement
to pay John Stephens the amount of
\$1,000.00 in monthly installments at

a minimum of \$100.00 beginning the
first of February 1977 and continuing

for 12 months. This will be in repayment
of a loan made to me in November 1976

Wayne E. Carr Ph.D.

11-24-16

W.S. Trunks again!!

I am also paying the party of
my friend my friend but not paid

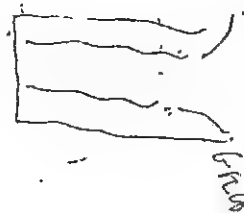
Wayne E. Carr, Ph.D.
6155 Plumas St. # 278
Reno, NV 89509

11-24-96

John Stephens

P.O. Box 801871

Santa Clara, CA 95080



This is a statement of my agreement
to pay, John Stephens the amount of
\$1,000.00 in monthly installments of
a minimum of 100.00, beginning the
first of February 1997 and continuing
thereafter. This will be in repayment
of a loan sent to me in November 1996.

Wayne E. Carr Ph.D.

11-24-96

P.S. Thanks again!

I'm also faxing the copy of
the drawing my friend had lost.

11/24/1996 19:03 70282589800

WAYNE E. CARR PH.D.

Wayne E. Carr, Ph.D.
6155 Plumas St. # 278
Reno, NV 89509

11-24-96
John Stephens

P.O. Box 801871
Santa Clarita, CA 91380

This is a statement of my agreement
to pay John Stephens the amount of
\$1,000.00 in monthly installments of
a minimum of \$100.00, beginning the
first of February 1997 and continuing

thereafter. This will be in repayment
of a loan sent to me in November 1996.

Wayne E. Carr Ph.D.
11-24-96

P.S. Thanks again!!

I'm also faxing the copy of
the document my friend had lost, wait

PAGE 01

WAYNE E. CARR PH.D.

11/24/1996 19:07 7028258980

13 Central Way #387
Kirkland, WA 98033
1 888 540 6085

WayneCarr@RemoteViewers.com
WWW.REMOTEVIEWERS.COM

FINAL QUALITY ACCEPTANCE

WARNING
When unloading and unpacking this shipment, Harris requests that this will be done in compliance with static control practices. This means the use of a grounded wrist strap at a static controlled workstation for any electrical and/or visual/mechanical verification. When returning product to Harris, use the original antistatic packing without adding non-antistatic materials to avoid ESD damage and liability for payment of damaged parts as covered under the terms and conditions of the purchasing contract. Thank you.

INVOICE TO
R. W. ELECTRONICS
1445 MAIN ST.

TEWKSBURY

MA 0177

SHIPPER NO.		PART. SHIP NO.		NO. TYPE CONT.	WEIGHT	WAYBILL NUMBER	
NOW		7601-BPC		FG03			
CUSTOMER P.O. NUMBER				GOV'T. PRIME CONTRACT NO. & RATING		CUST. CODE	CUSTOMER NO.
N/A						RWE	95777-00
SALES ORDER NO.	REV.	DATE ENTERED	SHIP VIA	P.P.D.	COLL.	F.O.B. POINT	COMMODITY NO.
000007	E	062687	BEST SURFACE		X	PALM BAY, FLA. <input checked="" type="checkbox"/> DEST <input type="checkbox"/>	
TERMS		COFC	C.S.I.	G.S.I.	IMPORT DOCUMENT NO.		EXPORT DOCUMENT NO.
000000CIA		N	N	N			
LINE ITEM	HARRIS PART NO.	SPECIFICATION NO.		DELIVERY REQUESTED	DELIVERY SCHEDULE	QUANTITY ORDERED	QUANTITY BACK ORDERED
	CUSTOMER PART NO.	REV. QUOTE NO.					
03	HM1-7611-5	42 071587		071537	26408		26408
	LA#/QTY: 8A40049 (26408)	8718230A					
SPECIAL CUSTOMER SERVICE INSTRUCTIONS							
OPER: WENDY PHON: 7061 DT: 062687							
CONTACT CLARK BEFORE SHIPPING							
LINE ITEM 01 NEEDS TO SHIP UPS BLUE COLLECT.							
ALL OTHER LINE ITEMS SHIP CONSOLIDATED							
FREIGHTWAY COLLECT.							
DIC 8727							

FINAL PAGE 1 LAST PAGE

THIS IS TO CERTIFY THAT ALL ITEMS INCLUDED IN THIS SHIPMENT HAVE BEEN INSPECTED AND CONFORM IN ALL RESPECTS TO THE SPECIFICATIONS AND REQUIREMENTS APPLICABLE TO THE ABOVE REFERENCED PURCHASE ORDER. THE EXCLUSIVE REMEDY FOR NON-COMPLIANCE OF AN ITEM WITH THIS CERTIFICATION IS THAT SET FORTH IN THAT CLAUSE ENTITLED "WARRANTY" UNDER WHICH THE ITEMS ARE SOLD.

CERTIFICATE OF COMPLIANCE

APPROVALS	
PLANT CLEARANCE	G.S.I.
60557 1-JUL-87	
C.S.I.	L.A. REFERENCE

George Ellis
MANAGER, QUALITY ASSURANCE

PHONE :
PROJECT :

[illegible]

EAST COAST OFFERING
SOUND LAB

8317 Philadelphia Road
Baltimore MD 21237

301/574/4223

Norman F. Noplock engineer/owner

March 23, 1984

STEPHENS ELECTRONICS, INC.
313 Pacific Avenue
Burbank CA 91505

Mr. STEPHENS

First I would like to thank you for helping me make a decision on the Stephens 821B - 104A - 40/20 repair. I am enclosing 850.00 dollars as deposit for starting the repair work. We discussed a thousand dollar deposit, however eight fifty is more agreeable with my present budget. If additional money is needed to begin the repair, please notify me. I will have secured money for the entire repair cost by April 6/84.

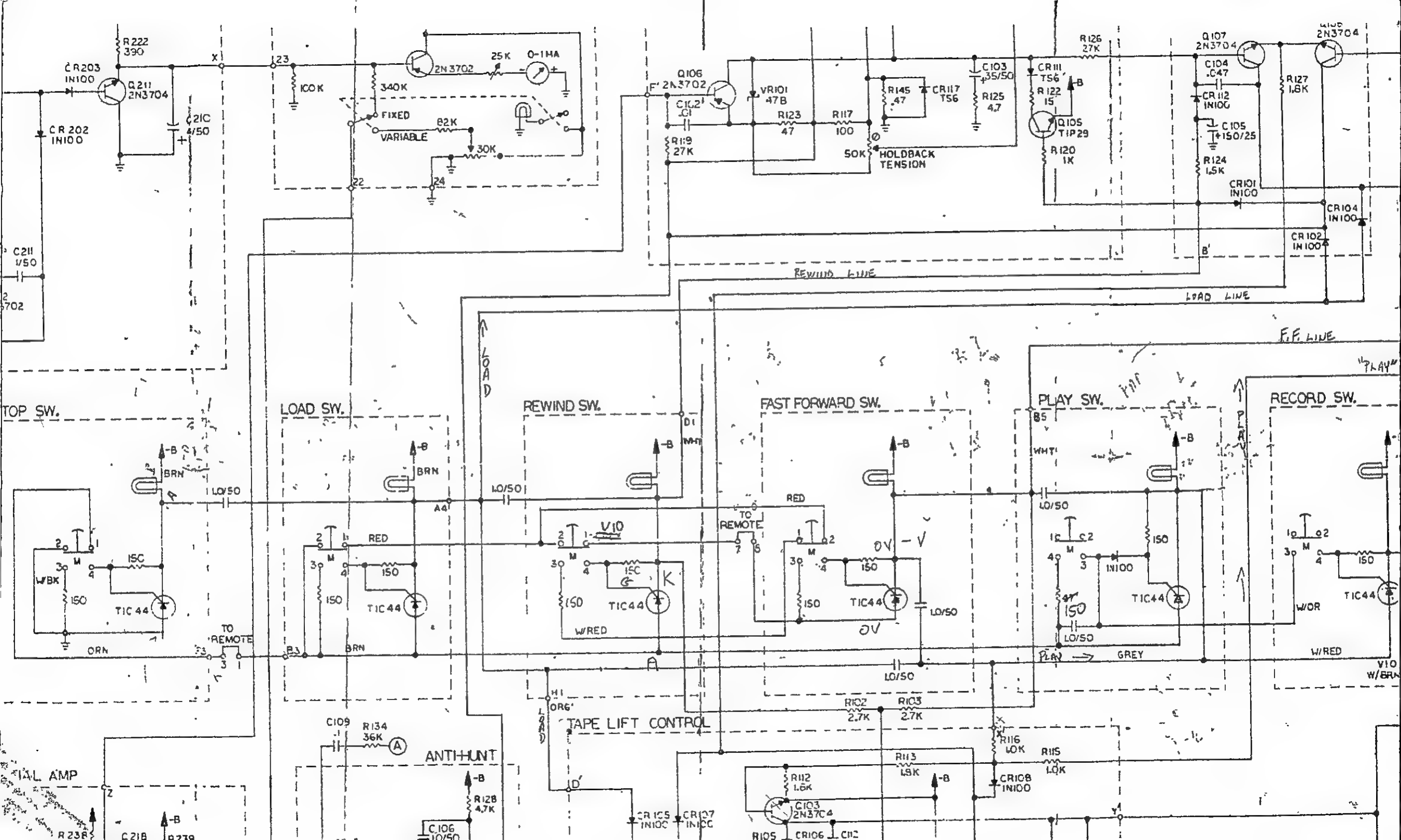
Please return comment on the price of a splice block for the machine and any information prescribing alignment tapes.

Please return comment on information describing a Stephens 2 Track Mastering Machine with editing facilities. We are in the market to purchase a high quality mastering machine.

Cordially yours

Norman F. Noplock

Norman F. Noplock



RECORDING SERVICES COMPANY

TROUBLE REPORT

Date: 7/22/84

Your name: Bruce / Ken

Client/job contact/phone Mix@RSC

() 1200 () A
() B
() ATR100 () C
() D
(X) Stephans () E
() F
() Ad-Sm (X) 811D 167
() Q Lock
() DOLBY _____

Circle: 7 1/2 (15) 30 ips (#3) (other) 250 456 (PBO) (other)

Nature of problem as first noted:

(how long machine running, settings, how discovered, etc.)

on check in from previous rental w/c 7/21/84
it was found that ^{PLAYBACK} ch 7 output level too high /
distorted; could not turn down; no adjustment
^{TRIM POT}
has an effect. ~~to~~ changed lower plugin module with
13-16, problem went to 15. Suspect open
feedback loop.

Initial corrective action taken: exch 5-8 & 13-16
lower modules.

Thank you for taking the time to fill out this form.

TROUBLE REPORT

Date: 12/26/84

Your name: Bruce B. Black

Client/job: B. B. Black
contact/phone:

() 1200 () A
() B
() ATR100 () C
() D 81.7
() Steph () E 16.7
() F
() Ad-Sm ()
() Q Lock
() DOLBY

Circle: 7 1/2 (15) 30 ips +3 250 456 (other) PBO (other)

Nature of problem as first noted:
(how long machine running, settings,
how discovered, etc.)

1. ch 16 motor - no movement possibly burned out.
2. FF, RW Buttons didn't work (initially, then) no response when FF/RW buttons pressed
3. ch 6 HISSY.

Initial corrective action taken:

1. none, guesser was ch 1-8 & 23 only.
2. removed, reseated magnetic core & after motor; Temp. was cured, problem recurrd periodically.
3. swapped motor 620 amp motor. with ch 11. Ch 11 cleared up.

A B C D E F G H

1	2	3	4	1	2	3	4
5	6	7	8	5	6	7	8
9	10	11	12	9	10	11	12
13	14	15	16	13	14	15	16
17	18	19	20	17	18	19	20
STEWARTS				3M #1			



3M-2

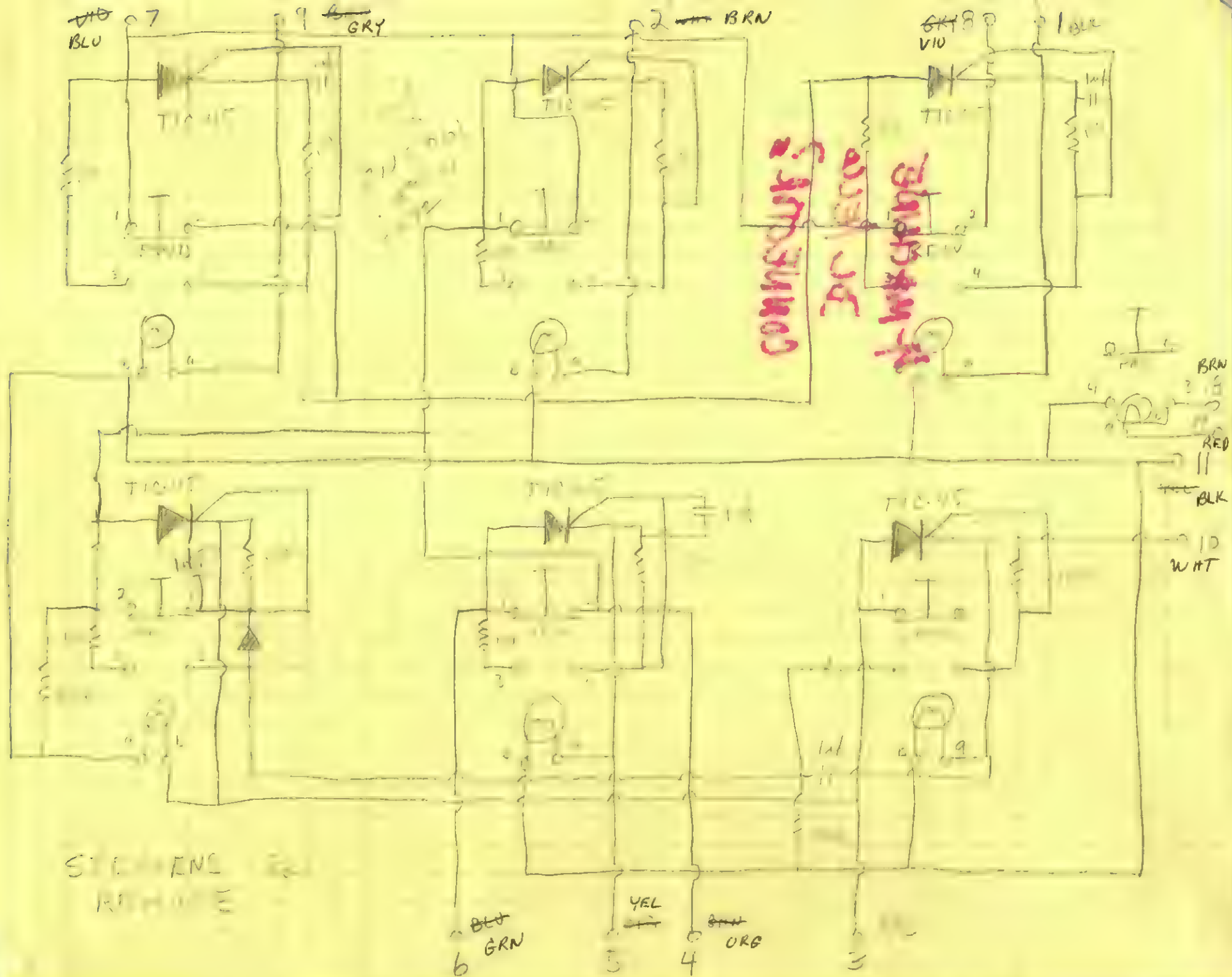
AMER

1	2	3	4	1	2	3	4
5	6	7	8	5	6	7	8
9	10	11	12	9	10	11	12
13	14	15	16	13	14	15	16
17	18	19	20	17	18	19	20

- 1
- 2
- 3
- 4
- 5
- 6
- 7

4 MACHINE
DL/ELCO
CONNECTOR?

1-15
1-16
1-17
1-18
1-19
1-20
1-21
1-22
1-23
1-24
1-25
1-26
1-27
1-28
1-29
1-30
1-31
1-32
1-33
1-34
1-35
1-36
1-37
1-38
1-39
1-40
1-41
1-42
1-43
1-44
1-45
1-46
1-47
1-48
1-49
1-50
1-51
1-52
1-53
1-54
1-55
1-56
1-57
1-58
1-59
1-60
1-61
1-62
1-63
1-64
1-65
1-66
1-67
1-68
1-69
1-70
1-71
1-72
1-73
1-74
1-75
1-76
1-77
1-78
1-79
1-80
1-81
1-82
1-83
1-84
1-85
1-86
1-87
1-88
1-89
1-90
1-91
1-92
1-93
1-94
1-95
1-96
1-97
1-98
1-99
1-100



240V 2-WIRE

CONNECT

BUTTON ENGRAVING

30⁰⁰ SETUP
 + 50⁰⁰ PER HOUR RATE
 + 15⁰⁰ CHARACTER - 30⁰⁰ ea

30⁰⁰
 30⁰⁰
 22
 65
 3.20
 78.20 ESTDPS

20' 9/16

FOUR HOLE 100 PANEL

SET UP 30⁰⁰ PER

REMOTE 22-5/16 10⁰⁰ hole

~~11/11~~

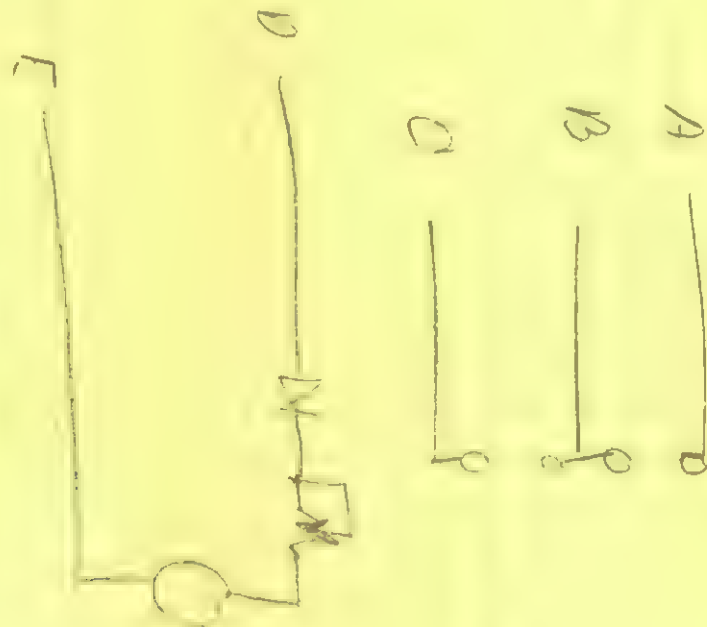
SHEAR
 SET UP 10⁰⁰
 150 PANEL

10 WORKING DAYS

MATERIAL 150 PANEL

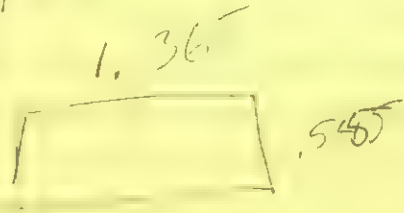
COUNTER SINK 500 Set up
 10⁰⁰ hole

ANALYZING 25⁰⁰



2 TRACK 1

2 4 TRACK



$$\begin{array}{r} 138 \\ 1,125 \\ \hline 2,063 \end{array}$$

LEAF 4-4 ✓

27

578

136

$$\begin{array}{r} 1,365 \\ 1,375 \\ \hline 3,740 \end{array}$$

$$\begin{array}{r} 13 \\ 3 \\ \hline 39 \end{array}$$



568

27/52

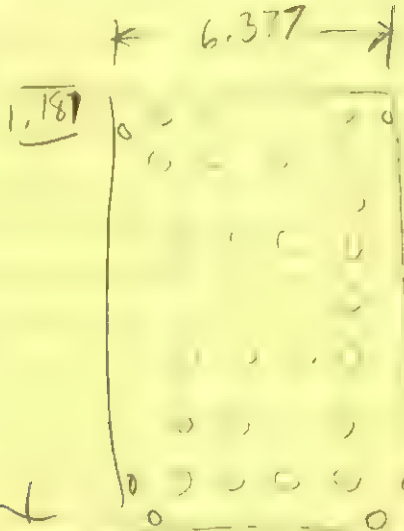


27/52 1835



.925

$$\begin{array}{r} 844 \\ 250 \\ \hline 594 \end{array}$$



$$= 1.245$$

$$\begin{array}{r} 1.375 \\ 1.0 \\ \hline 1.62 \end{array}$$

POINTS

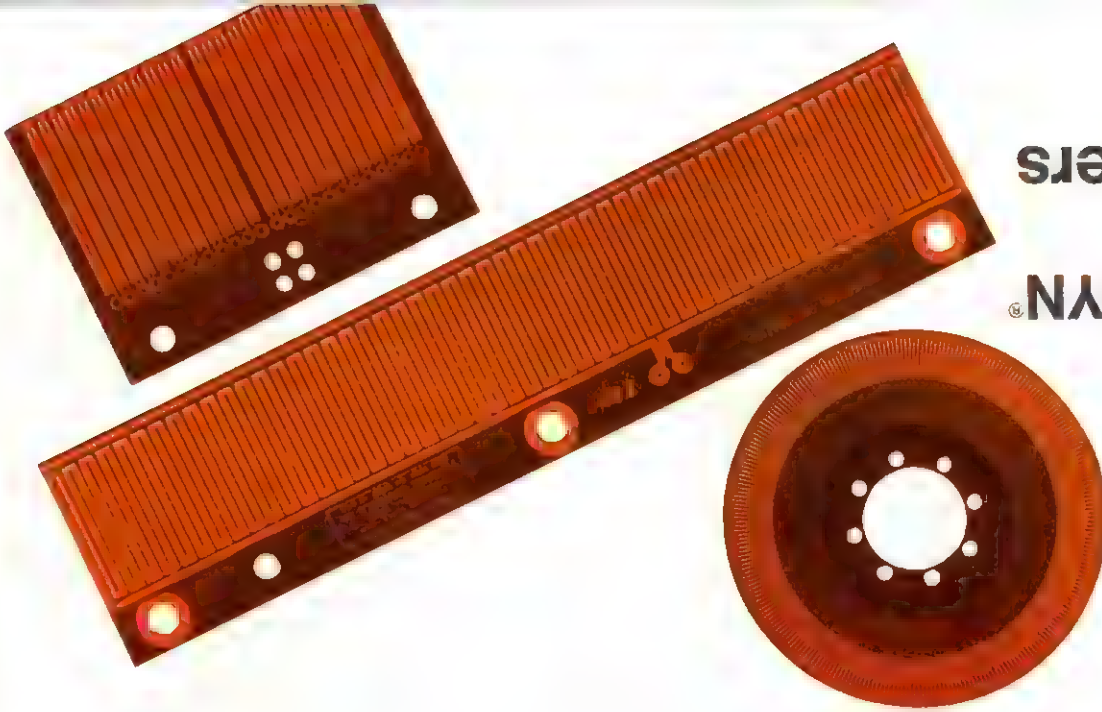
$$\begin{array}{r} 925 \\ 594 \\ \hline 1,519 \end{array}$$

$$\begin{array}{r} .23 \\ .23 \\ \hline \end{array}$$

$$\begin{array}{r} 1.2 \\ 1.2 \\ \hline 4.76 \end{array}$$

$$\begin{array}{r} 1.17 \end{array}$$

Farrand INDUCTOSYN® Position Transducers



Applications:

Rotary Inductosyn transducers

Rotary tables
Angular data transmission
Electronic dividing heads
Electronic shaft speed ratio control
Gear testing
Theodolites
Antenna positioning and readout
Missile guidance
Gunfire control
Inertial navigation
Computer peripheral devices

Linear Inductosyn transducers

Machine tools
Measuring machines
Computer disc memory
Linear actuators
Precision screw testing



FARRAND CONTROLS

99 Wall Street/Valhalla, N.Y. 10595/Tel.: (914) 761-2600/Telex: 131554

INDUCTOSYN® is a registered trade mark of Farrand Controls.

Advantages of Inductosyn transducers

- Highest accuracy encoding . . . to 1/2 arc-second full circle or 50 micro-inches per 10-inch segment.
- Repeatability better than 0.1 arc-second or 10 micro-inches.
- Analog and/or digital outputs relatively insensitive to decentering or misalignment.
- Direct mounting eliminates errors introduced by lead screw accuracy and backlash.
- Meet MIL E-527B and MIL Std. 202B specifications for shock, vibration and temperature.
- Linear 10-inch segments can be positioned to compensate for fixed errors of machine—have supplied spars with 10-inch Inductosyn sections up to 92 feet in length.
- Can be used as either transmitters or receivers.
- Impervious to oil vapor.
- Operable with carrier frequencies from 1 KHz to 1 MHz or more.
- Rugged . . . used in inertial navigation and missile guidance systems as well as precision N/C machining centers.

This array of rotary and linear Inductosyn transducers and their elements provides an idea of the variety and range of sizes available. Inductosyn steel tape scales come in any length up to 60 feet, with longer lengths on request. Farrand Digital Readout console appears at top right. Pulse converter IC modules are shown at the left.



Ultra-precision angular and linear measurement, analog or digital

Farrand Inductosyn rotary and linear position transducers rate among the world's most accurate encoding devices, with accuracy as fine as $\frac{1}{4}$ arc-second and 50 millionths of an inch respectively and infinite resolution capability. Each type has two elements inductively coupled across a small air gap. Since they don't touch, there is no wear.

The rotary Inductosyn transducer...

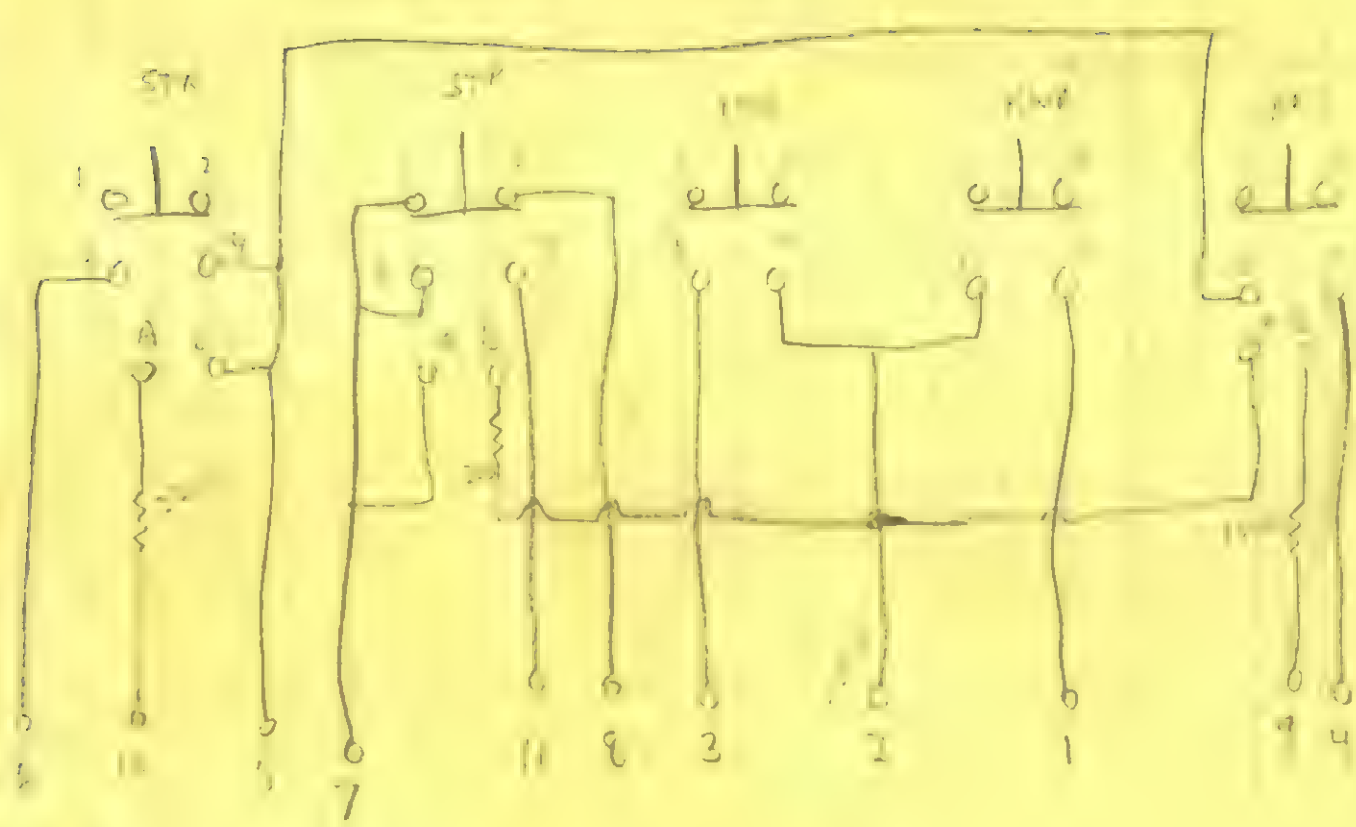
... consists of a rotor and a stator. Either can be attached to the rotating shaft whose motion is to be measured, while the other is fixed to the bearing or mount. Non-contacting transformer pick-offs are also provided, eliminating the need for slip rings or other connections to the rotor. Any angle measured is determined by full circle averaging of all the included cycles, producing a degree of precision unapproached by any other shaft encoder. Base materials cover a broad spectrum of metallic and non-metallic substances, including stainless steel, aluminum, titanium, Invar, beryllium, plastic and even ceramics.

The linear Inductosyn transducer...

... includes a scale and a slider. As with the rotary type, either can be attached to the moving or stationary element. One moves relative to the other in a straight line. The linear model achieves its own very high degree of accuracy by cycle averaging over the full length of the slider. Scales are available in 10-inch (254-mm) bar segments and on continuous steel tape to any length.

The Farrand pulse converter...

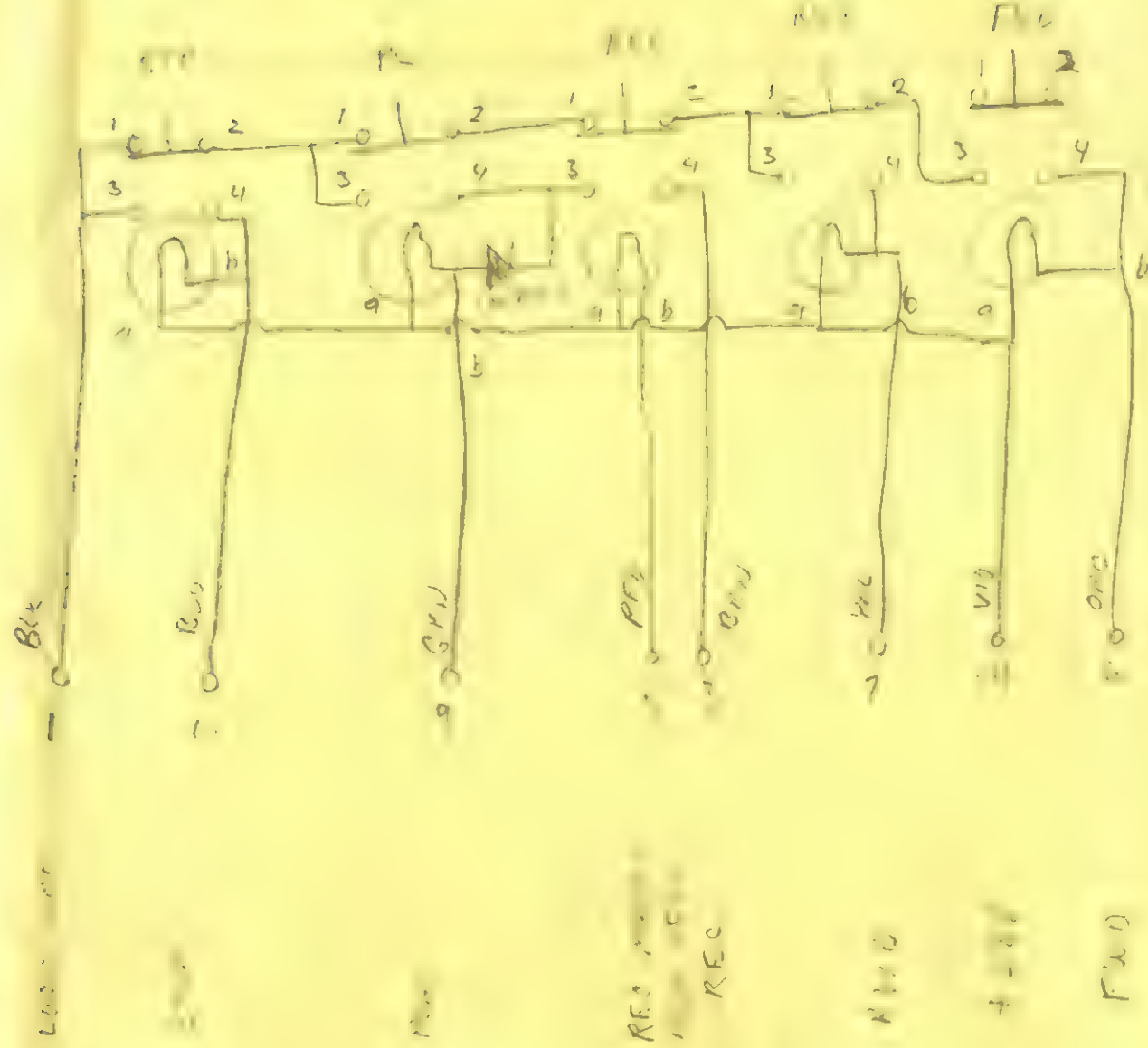
... is a closed loop electronic servo. It produces sine-cosine data derived from the processed position error signal from a rotary or linear Inductosyn transducer. The pulse converter's output consists of TTL compatible signals. The conversion, which can be either A/D or D/A, can generate as many as 20,000 pulses per cycle. With high speed tracking, dynamic readout can be as high as 48,000° per minute and 4800 inches per minute.



NON MOTION

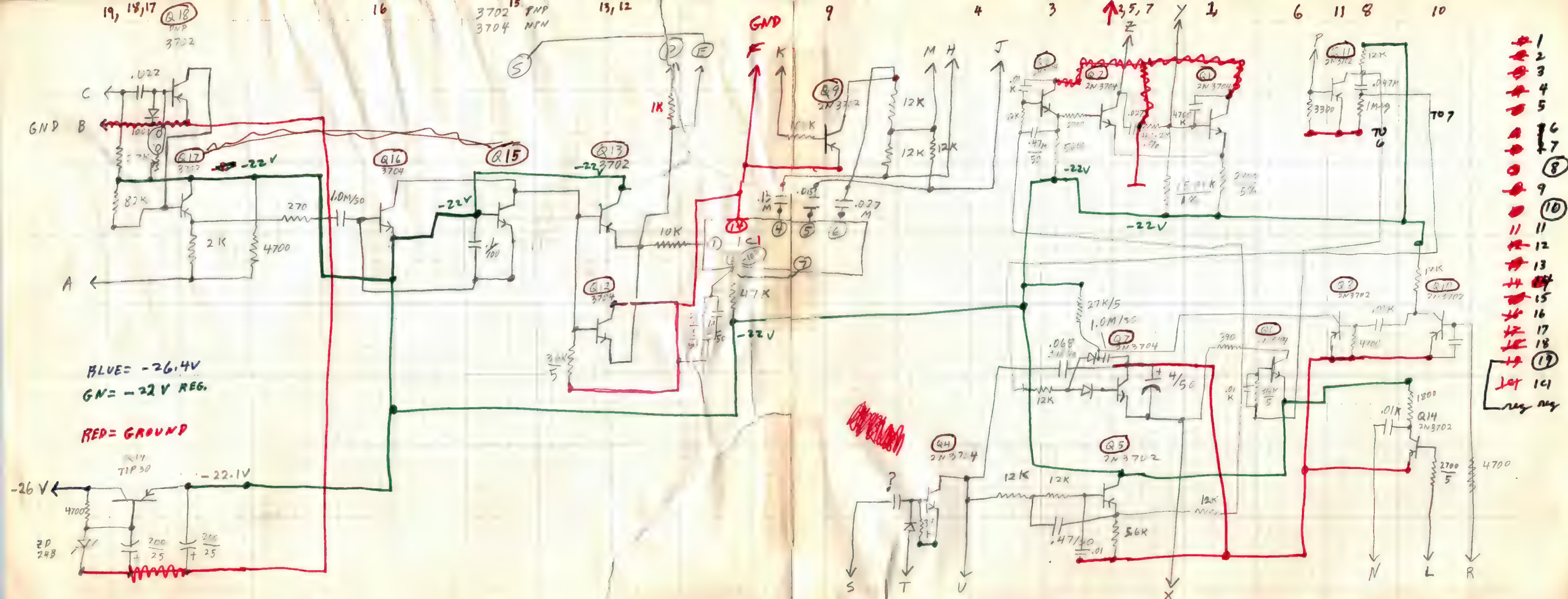
STN

4
P



311 79

7110



NOTES ON THE STEPHENS.

REFER TO MASTER SCHEMATIC

960 N at 15 IPS

SQUARE WAVES ARE DOUBLED
TO COMPENSATE FOR IRREGULAR
MASKING DISK

EMITTER FOLLOWER AFTER
COINCIDENTAL COUNTER
WHICH FIRES Q11 AND CHARGES
C16.

Q11 IS NORMALLY OFF DURING PLAY
BUT OF C16 — ^{COMES} SAWTOOTH WAVE

FED THRU LOW PASS FILTER

TAKES OUT HIGH FREQ COMPONENTS
AND GIVES ^{STEADY} DC COMPONENT WHICH IS
FED TO 2N3702 THEN 2N3704 WHICH GIVE
TEMPERATURE COMPENSATION BECAUSE
ONE XISTOR IS PNP + THE OTHER IS
NPN

THE HIGHER THE PRF THE HIGHER THE
NEG VOLTAGE,

KINTI HUNT

C 17 TAKE V

Q14

AS MOTOR CURRENT GOES THROUGH
TAKES TAKE OF MOTOR

Q14 GOES MORE NEG

IF FREQ RUN OFF →
ON SERVOS

PHASE DETECTION

60 Hz LINE PHASE ANGLE

60 Hz COUNTDOWN
CIRCUIT



GIVES DC COMPONENT

WIRELESS FEEDS DIFF AMP #5

HAD ROOMS ONLY $\pm 50\%$ VARIATION
VSO WHEN SHOWS PHASE ANGLE

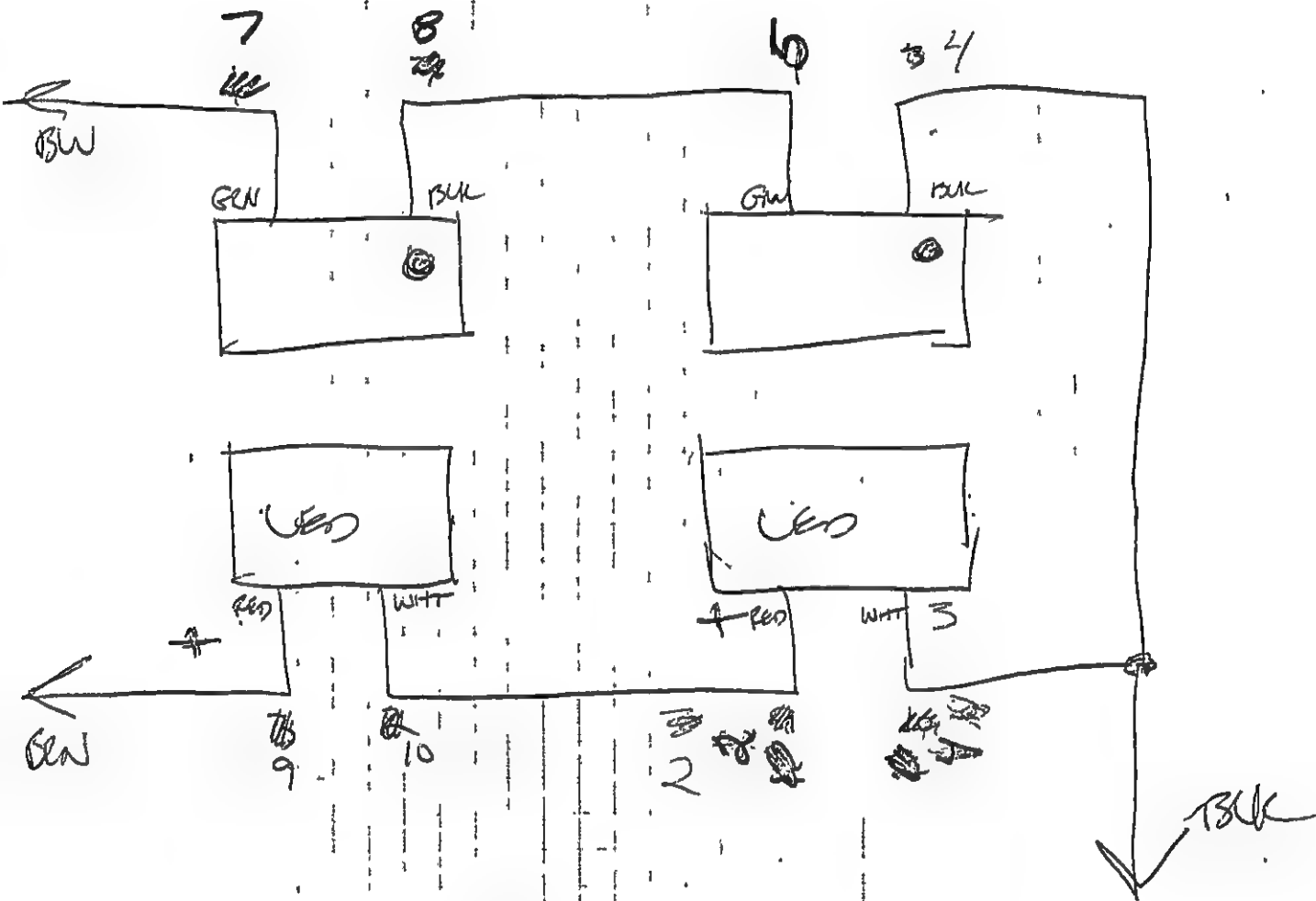
⑧

CONTINUOUS SPEED

REQ TO
VOLT CONVERSION

5- 1 0
 4- black : 8 black ✓
 5- green : 7 green ✓

UGAT SENSOR ASSEMBLY

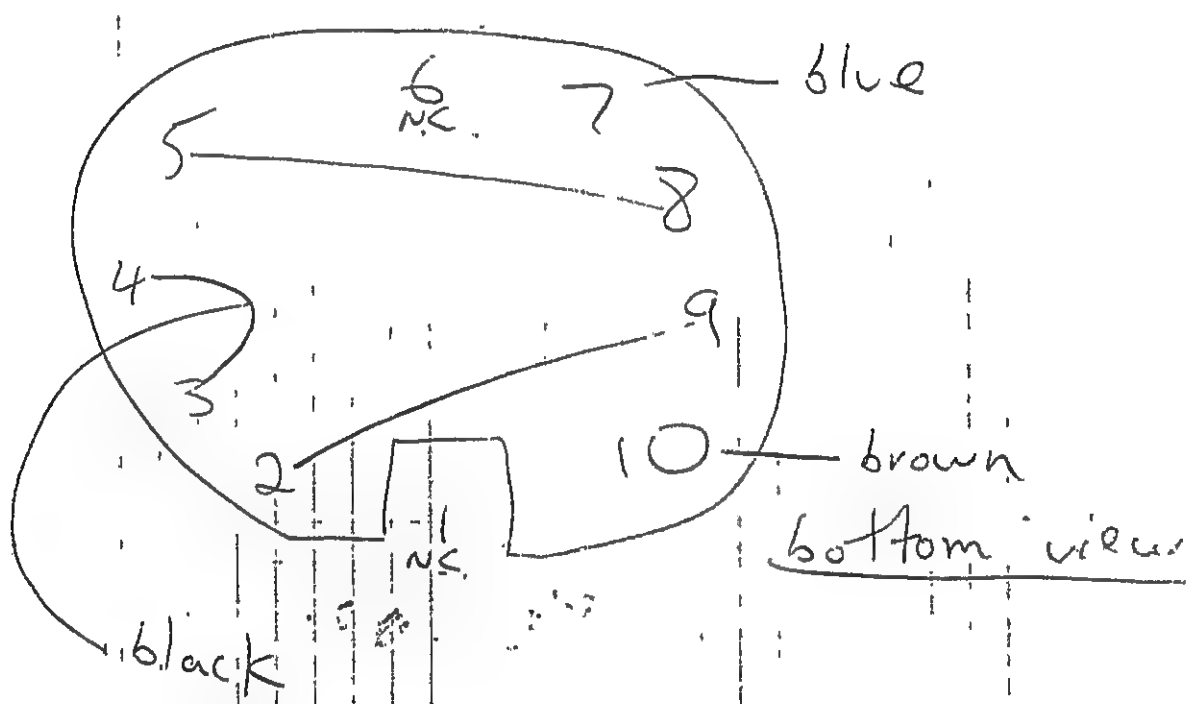
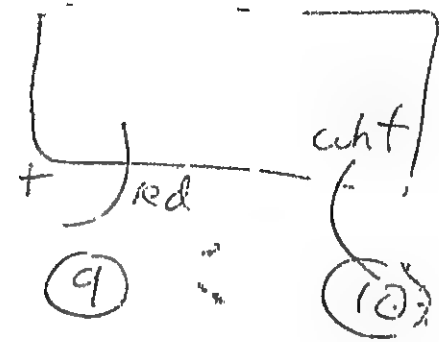
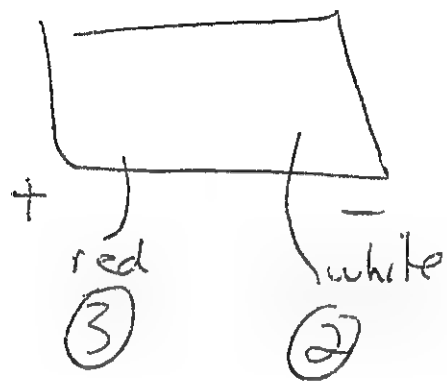
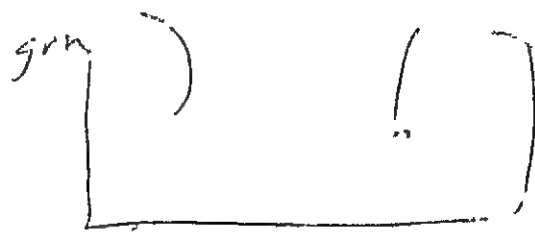
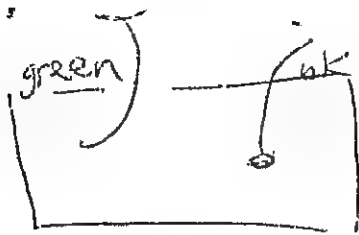


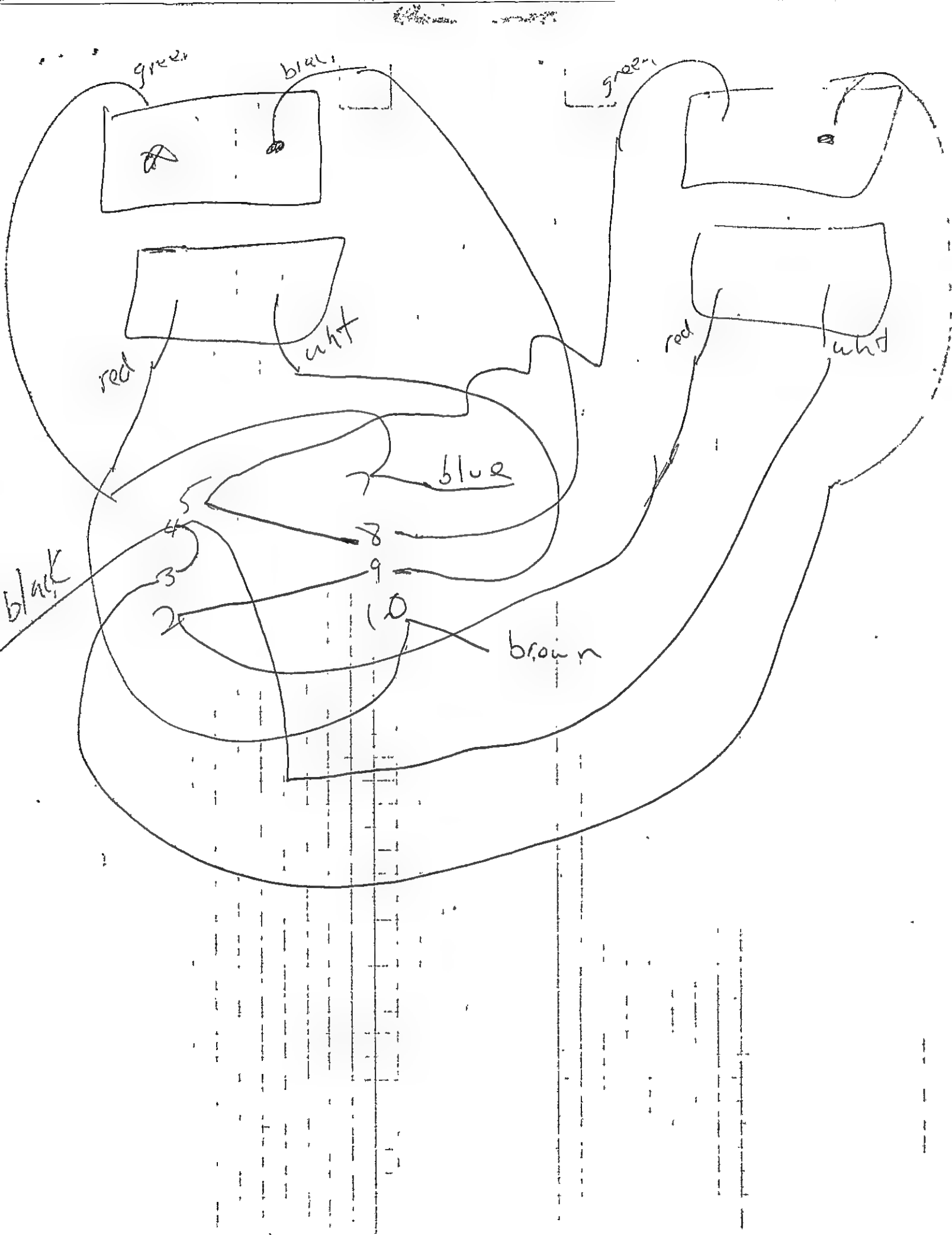
SOCKET WIRING

BROWN - #10
 BLW - #7
 BLK - #3+4
 JUMPERS - 2+9
 5+8

SEEN
 FROM
 BOTTOM
 OF
 SOCKETS





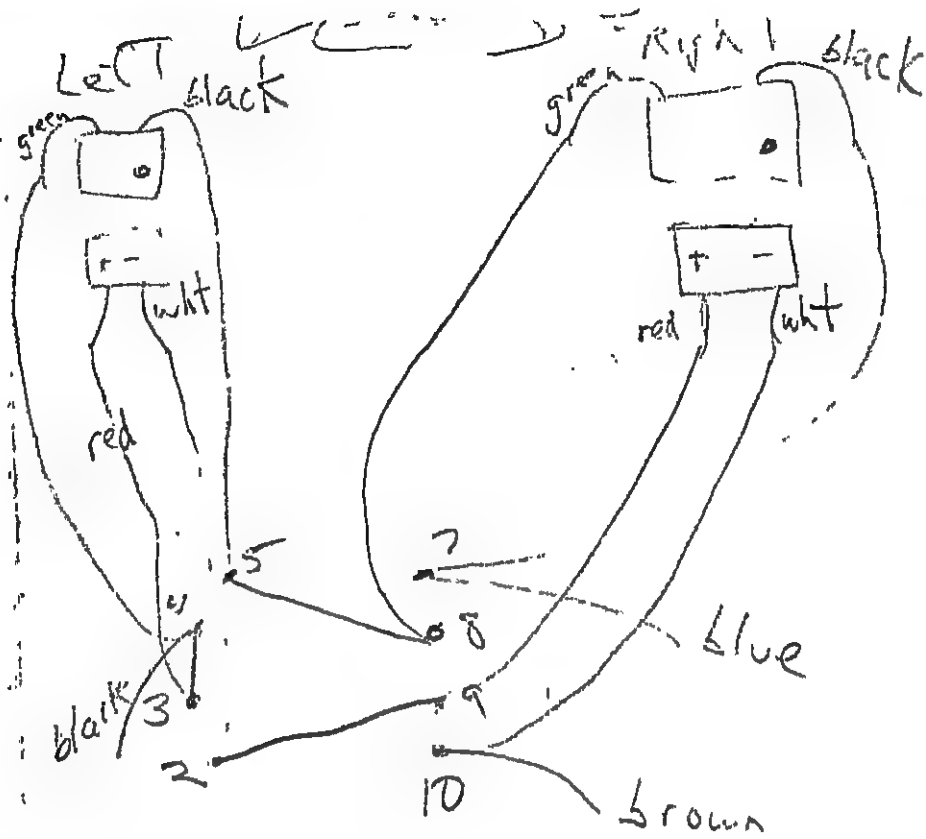


SENSOR TECHNOLOGY
21012 LASSEN ST
CHATSWORTH.

CONTACT: JACK COTTER
882-4100
ABOUT - STREET - 850 A

(IS IT A PHOTO TRANSISTOR
OR A PHOTO DARLINGTON
TRANSISTOR

PHOTO DARLINGTON
STREET 850 D



~~G~~ 6
~~G~~ B
~~G~~ R
 W

~~G~~ 6
~~G~~ B
~~G~~ R
 W



Bottom View

7011

$$\begin{array}{r} 307. \\ 800 \\ \hline 1107 \\ 800 \\ \hline 307 = \\ 200 \\ \hline 507 \\ 300 \\ \hline 807 \end{array}$$

460-200

.031 $\pm 5\%$ [test]

Set Range Scale on $\frac{C-D}{0-0.1}$

Set Multiply C-R-L Dial By.
on .01 m.

and the big Dial
on 3

under .031 m \pm For 102 Pts
on record co.

and over .031 m \pm for Pre- and
circuit board (.033 average)

all ca
missed 9'
wago for
heads.

Tom Miller.
390-9251
live Mass.

atlas

WIRE & CABLE CORP.

Whittier Phone (213) 695-0686

Los Angeles Phone (213) 723-2401

Orange Co. Phone (714) 739-0202

FREQ COIL

2 wires # 24 gauge

54" long.

~~2~~ WIND UP ALL THE WIRE

TAPE on top of two wire

THEN WIND 3 TURNS
OF # 30 wire AND

PUT TAPE ON TOP
OF THE wires

atlas

WIRE & CABLE CORP.

Whittier Phone (213) 695-0686

Los Angeles Phone (213) 723-2401

Orange Co Phone (714) 739-0202

Output coil -

4 wires #24 gauge 5'4" long

WIND UP ALL THE WIRE

(MARK ONE END) WITH MAGIC MARKER

THE END WITH THE MARK

Should have 4 turns less

wire unit. (INSTALL THIS END

TO THE yellow wires on BIAS chassis)

WRAP TAPE ON TOP OF THE

wires WHEN Finished.

614-

SL 26

Q. 1

2N3703⁰²

pins - 2-3-4 flat side up

Q. 3 -

2N3703

pins 5, 6, 9. round side up

Q. 4 -

2N3704

pins 1, 4, 7 - pinning up

Q. 2 - 2N3704

pin 5+3 - Reister round side up

1 - ^{long} Red Reister no 4, 75K
1K

1 - Brown - Black Brown

2 - Orange white Brown

1 - Brown - Black Brown

1 - Yellow - Purple - ^{Red}
Watt

2V3703. 4 8 26

Q 1 - pens 2-3.4 flat side up

2V3703

Q 3 - pens 5, 6, 9 rounded up

2V3704

Q 4 - pens 1, 4 7 hanging up

2V3704

Q 2 - round side up pens 5 & 3 Reverses

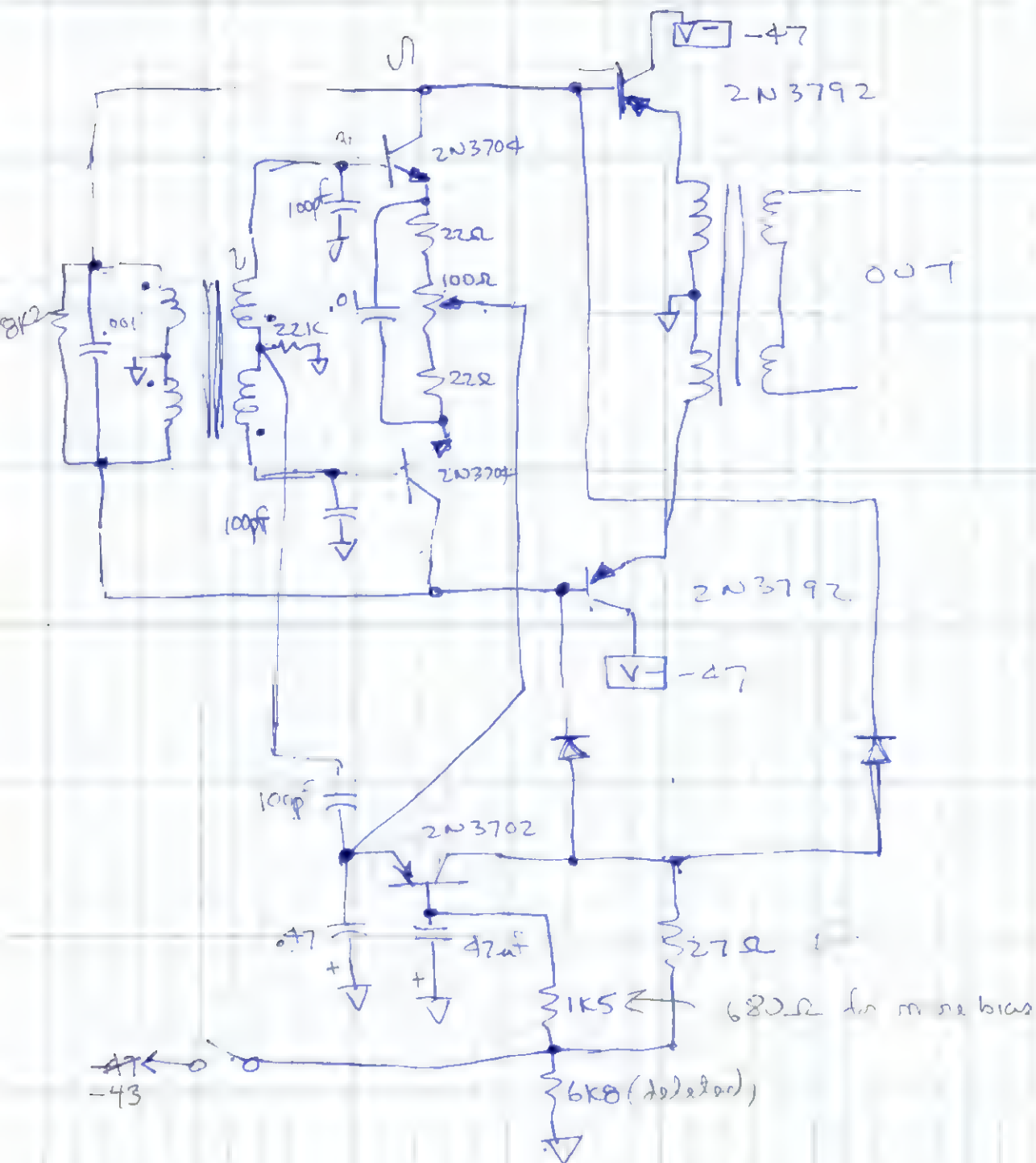
1 - Brown - Black Yellow

2 Orange white Brown 100K

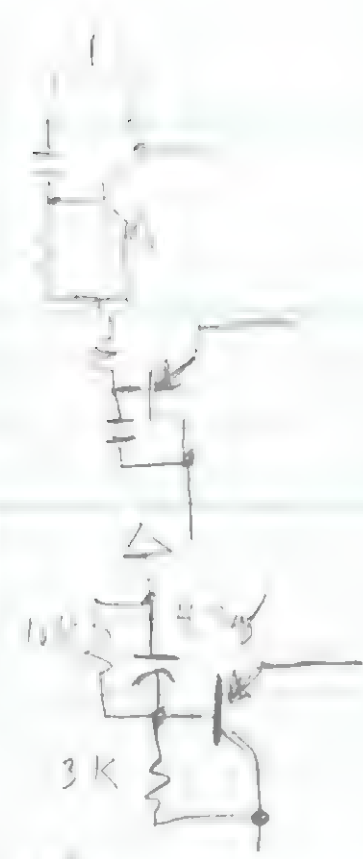
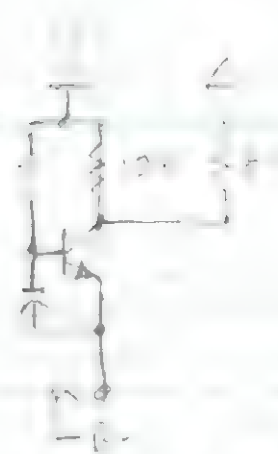
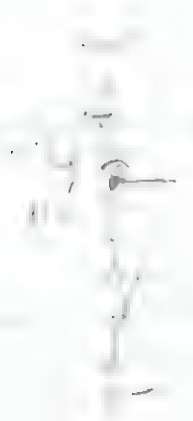
1 - Brown Black Brown

1 - yellow - purple - Red

1 - Red Reverses is 4.75K
all 4 with 1F

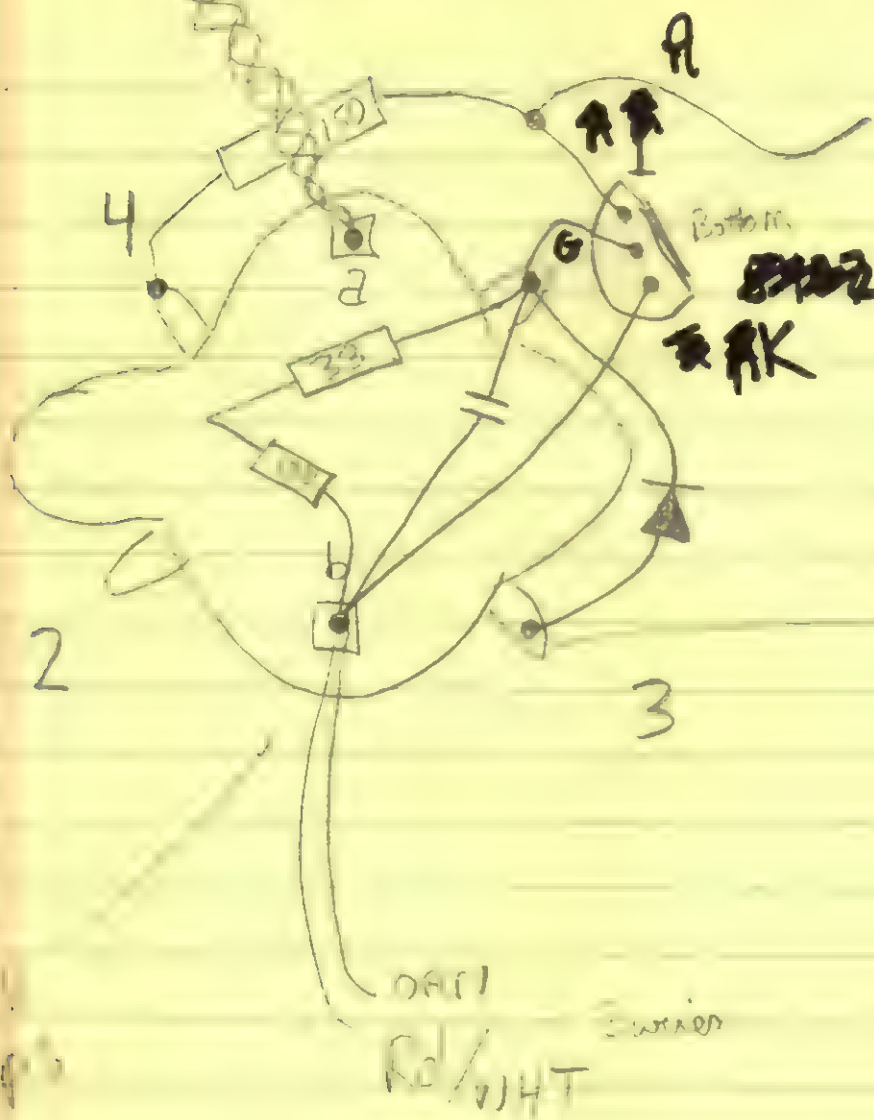


G. Liden 01-25-90
 Stephen's BIAS OSC.



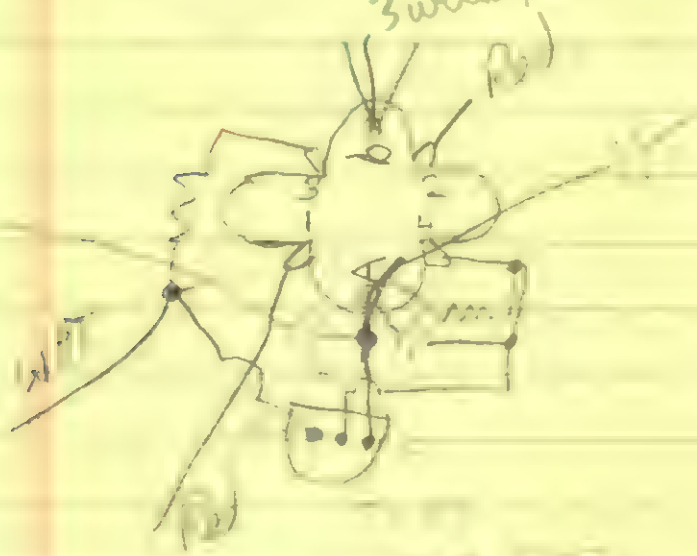
10V

10V

$$\lim_{n \rightarrow \infty} \frac{1}{n} \ln \frac{1}{n} = 0$$


720 5402
Reverse
A & K

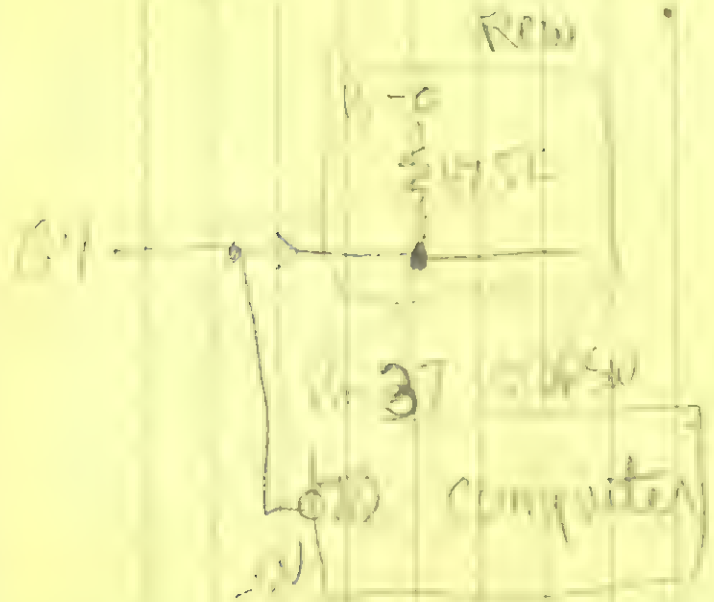
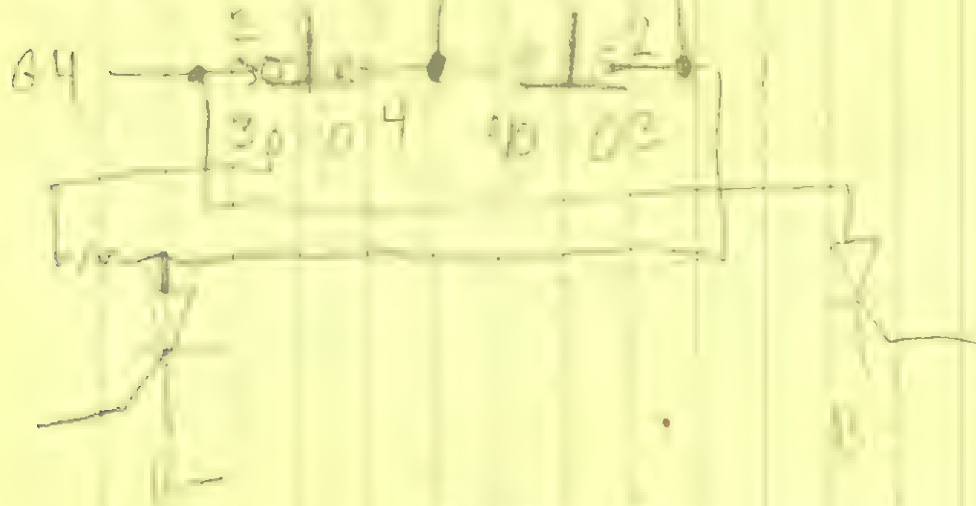
Upside Down FF ~~pen~~



50Hz or 240V
 1000W
 11K

1000W
 11K

11K



BRN	1	REWIND	1
RED	2	LOAD	2
ORN	3	PLAY	3
YEL	4	LOAD	4
GRN	5	STOP	5
BLU	6	STOP	6
VIO	7	REWIND	7
GRY	8	FWD	8
WH	9	FAST FWD	9
BK	10	RECORD	10

WH/BRN

RED

" ORN

" YEL

" GRN

BLU

" VIO

" GRY

WH/BK/BRN

WH/BK

WH/RED/GRN

WH/BK/RED

WH/RED/ORN

WH/RED/YEL

WH/RED/GRN

WH/RED/BLU

WH/RED/VIO

WH/RED/GRY

WH/BK/GRN

WH/ORN/BLK

WH/BLK/BRN

WH/BLK/BLU

WH/BLK/VIO

WH/ORN/YEL

WH/ORN/GRN

WH/ORN/BLU

WH/ORN/VIO

WH/ORN/GRY

WH/BLK/GRY

11 -27V LIGHTS

12 -27V VSO

13 VSO

14 VSO

15 VSO GND

16 COM SPEED GND

17 HOT SPEED (NC)

18 PRE

19 GND

20 COUNT DOWN OUT

21 SYNC AMP OUT (NO

22 COMP IN

23 PS?

24 MP IN?

25 DISPLAY STICK

26 (NC)

27 DISPLAY STICK

28 A4"

29 A5"

30 A6"

31 A7"

32 "00" FOOTSTORE LAMP

33 "01" PROG STORE LAMP

34 "02" PROG SEL LAMP

35 "03" START LAMP

36 "04"

37 "05"

38 "06"

39 "07"

40 "08"

PLAY "03" LAMP RETURN
ON SHUTTLE CONTROLS AS WELL AS GII LIGHTS



41 "B5"

42 "B6"

43 "B7"

44 "C0"

45 "C1"

46 "C2"

47 "C3"

48 "C4"

49

50

DIS STICK

H BUSS 1,2,3, FOOTSTORE

H BUSS 4,5,6 PROG STORE

H BUSS 7,8,9 PROG SEL

H BUSS 0 START

DUMP

EXT REF

LINE REF

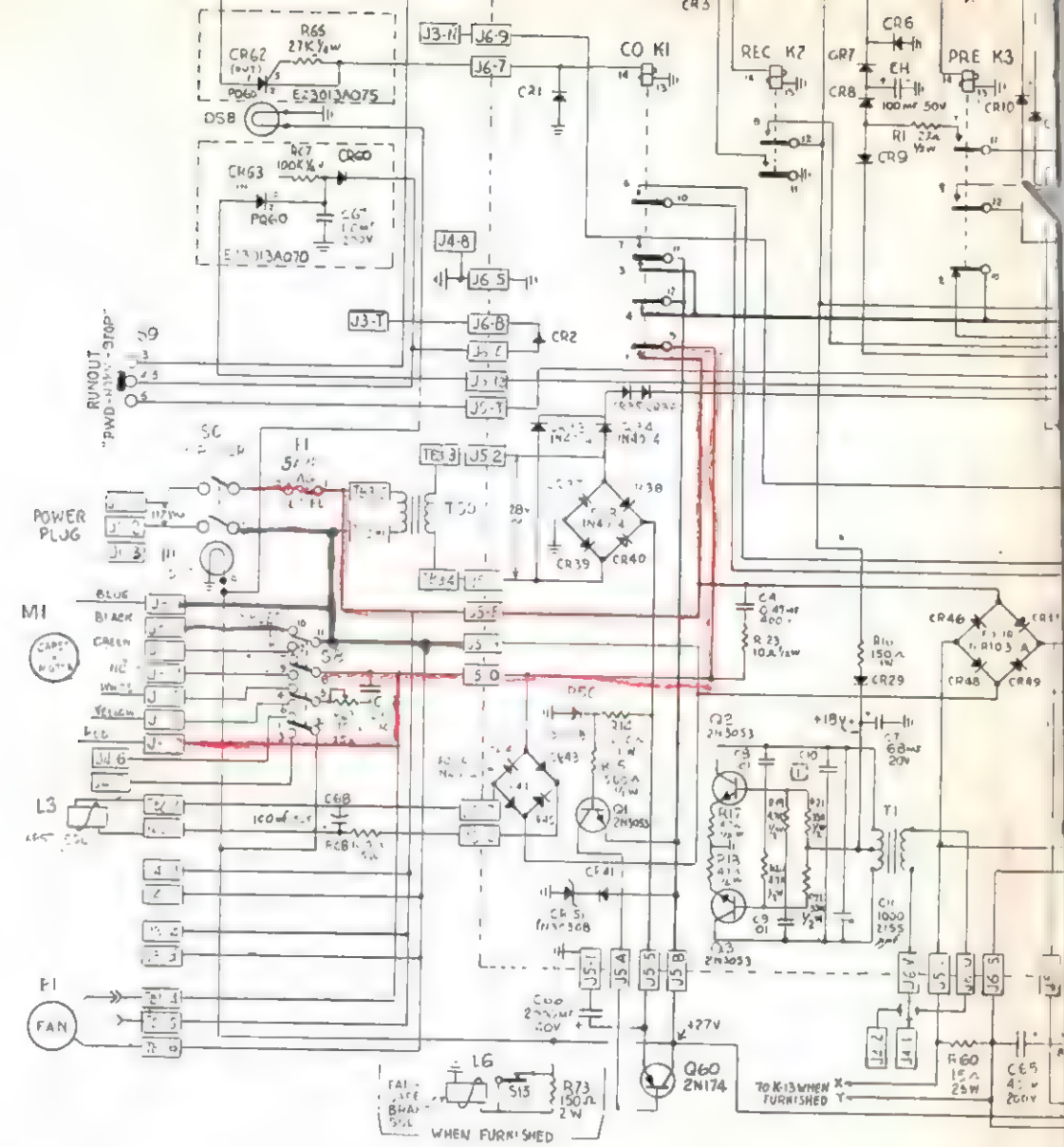
DIS STICK

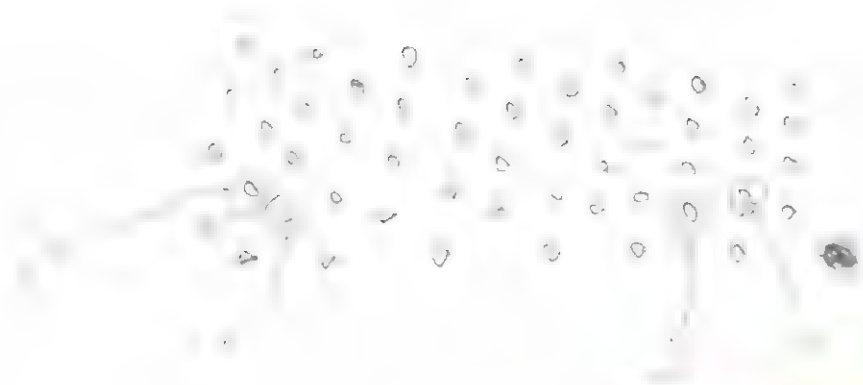
1. 100
 2. 100
 3. 100
 4. 100
 5. 100
 6. 100
 7. 100
 8. 100
 9. 100
 10. 100

1. 100
 2. 100
 3. 100
 4. 100
 5. 100
 6. 100
 7. 100
 8. 100
 9. 100
 10. 100

NOT
 Smith panels
 8 to dead

811?





8113

STEPHENS MODEL 214 VARIABLE SPEED OSCILLATOR



STEPHENS
ELECTRONICS, INC.
3513 PACIFIC AVENUE
BURBANK, CALIF. 91505
PHONE: (213) 842-5118



SPECIFICATIONS

GENERAL: The Stephens Model 214 Motor Power Supply is a solid state variable frequency power source, designed to control the speed of the capstan motor of a recorder or any similar system by varying its supply frequency.

INPUT: 117 V. A. C., 60 Hz., 2A.

OUTPUT: Modified 115 Volt RMS square wave, 150 Watts maximum.

FRONT PANEL: One six-position control switch; red pilot light; yellow indicator light; internal frequency oscillator controls for coarse and fine; four inch wide meter calibrated from 0-100 Hz.; meter calibration adjust; circuit breaker - all mounted on a standard 19" x 3-1/2" panel.

FRONT PANEL CONTROLS: 1. Six Position Switch; (a) "Emergency A. C." - 117 Volt fed directly to output in the event of failure (to eliminate down time.) (b) "Off." (c) "Sync" - Frequency controlled by external source. Output drops to zero volts if the source is less than 0 dbm. Maximum input +8 dbm. (d) "Auto" - Frequency controlled by external source. Output switches to sync with power line frequency if external signal drops below 0 dbm. (e) "Line" - Unit operates in sync with power line frequency. (f) "Internal Oscillator" - Frequency variable between 40 and 80 Hz. and can also be controlled by supplying a 0 to -30 V. D. C. control voltage. 2. Coarse Tuning Control - varies frequency between 40 and 80 Hz. 3. Fine Tuning Control - permits vernier frequency control of ± 1 Hz.

ADJUSTMENTS: 1. Meter calibration is achieved by switching to "LINE" or "EMERGENCY." Meter can then be calibrated to power line frequency (60 Hz.) 2. Internal oscillator frequency range is adjusted by the trimmer located on the rear of the chassis; shifts frequency range higher or lower.

DIMENSIONS: Standard rack mounting, 3 - 1/2" x 19" x 7" deep.

WEIGHT: 7 Lbs.

FINISH: Light gray color #26440 per Fed. Std. 595.

OPTION: 60 Hz. standard in place of line sync.

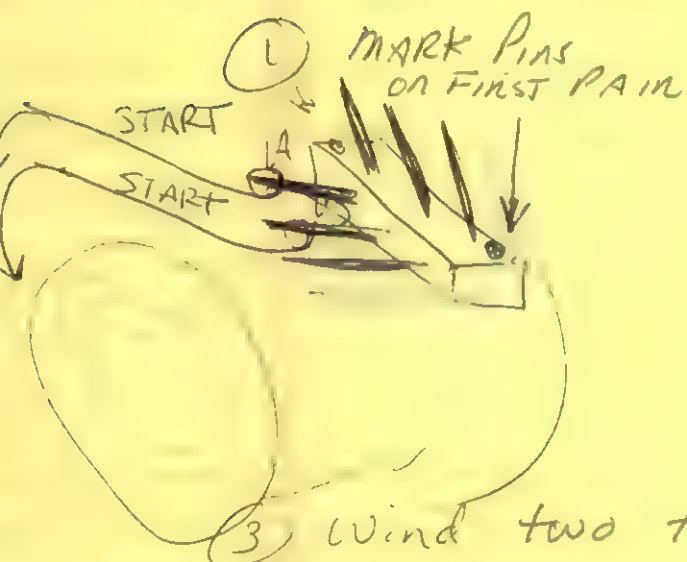
WARNING: LOAD MUST BE COMPLETELY ISOLATED FROM AC POWER LINE.

Two Types - 25-25 output ← 3B7-2616
 AND 30-~~4~~ ^{19/44 wire} oscillator
Winding

Bias Coils

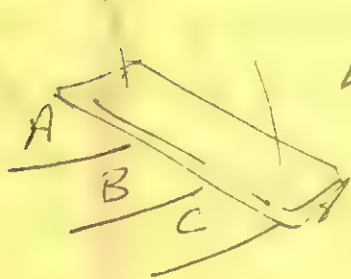
25/25 (4) pieces 56" long # ~~24~~ ^{60/44} gauge magnet wire
 30/3 (2) " 64" " # ~~24~~ ^{60/44} gauge

1. Strip wire ends $\frac{1}{8}$ " on each - can be done with heat from iron.



- (2) START SECOND PAIR
 180° From
 1ST PAIR ($\frac{1}{2}$ Turn)

- (3) Wind two turns by hand
- (4) Install coil on dull press jig and wind total of 25 turns



LEAD which Starts on "A" terminates on Pin "B".

LEAD which Starts on Pin "B" Terminates on Pin "C".

When taping windings overlap tape $\frac{1}{2}$ turn.

On ferrite cores use matched pairs.

Mark BOBBIN as to coil ratio before inserting into core

3D3 A100 cone

30 turns (2) wire same as other coil -

Tape and Wind 3 turns (2) wires
(From opposite terminal) and terminate the
same as before.

Winding Max driver (small Bobbin)
318A

#30 gauge - wind flush to edge of
Bobbin leaving room for taping

American Brass and Copper

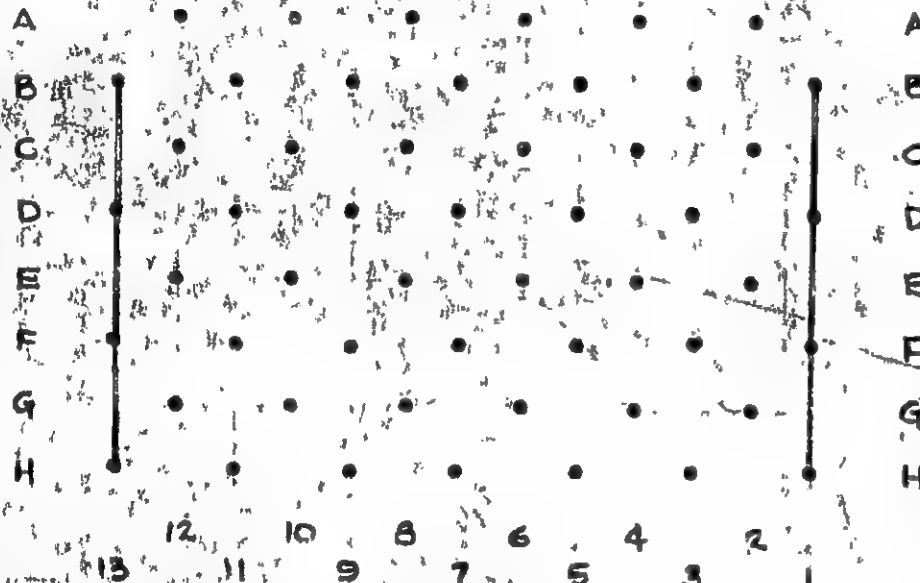
#4403 Line Amp Connector

AMPHENOL 220-1N052

Grounds.

13 - B-D-F-H

1 - B-D-F-H.



AMPHENOL 220-1N052

- A white + Blue = 12 - A-C-E-G
- B white + Brown = 11 - B-D-F-H
- C white + Brown = 10 - A-C-E-G
- D YELLO = 9 - B-D-F-H
- E white = 8 - A-C-E-G
- F green = 7 - D
- G blue = 7 - F
- H Red = 7 - H
- Gray = 6 - A
- VIOLET = 6 - C
- white + Gray = 6 - E
- white + Violet = 6 - G
- Red + white = 5 - B-D-F-H
- white + Red = 4 - A-C-E-G
- Orange = 3 - F
- Brown = 3 - H
- white + green = 2 - A-C-E-G

all wires
5" long

(V-strip)

4403

SCALE:

DATE: 12/11/73

1295 67th Street
Oakland, Calif. 94623
(415) 658-7212
Greater Bay Area: Enterprise 1-0780

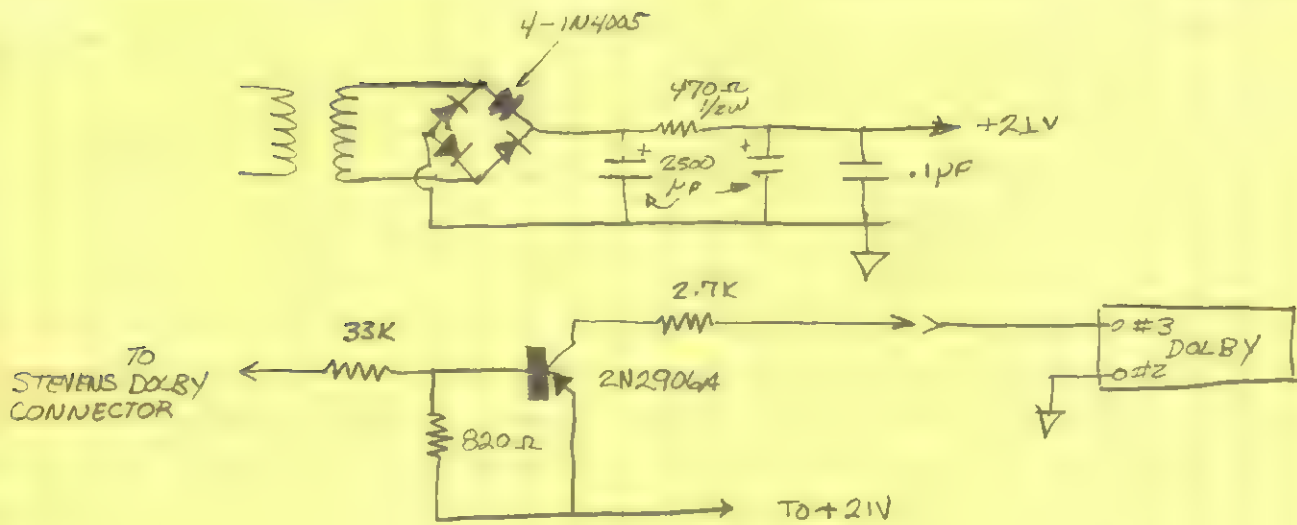
2131 So. Garfield Ave.
Los Angeles, Calif. 90040
(213) 726-3131

ALUMINUM
BRONZES
AMPCO METALS
PLASTICS
TUBE FITTINGS

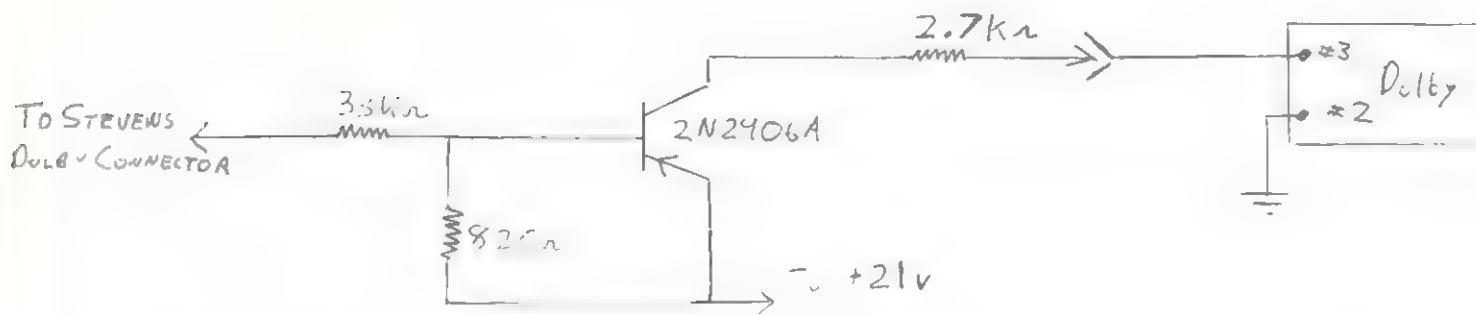
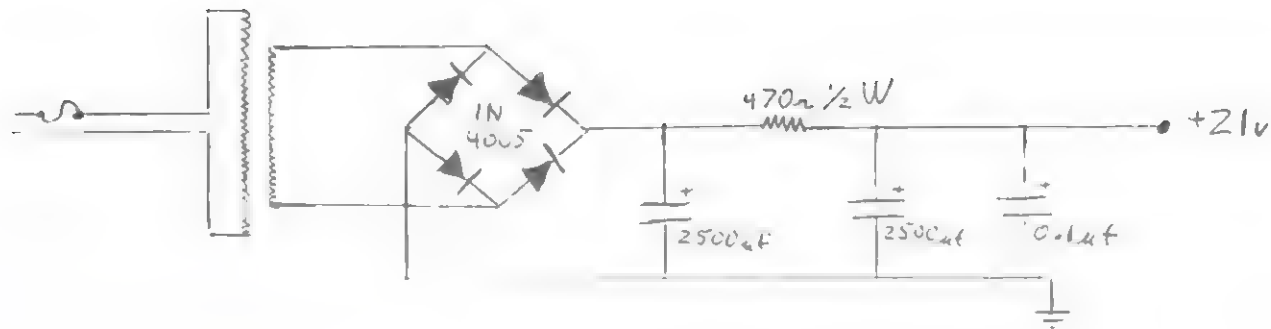
OFFICE COPPER
STAINLESS
RWMA ALLOY
MICARTA
FASTENERS

PRECISION SAWING, SLITTING

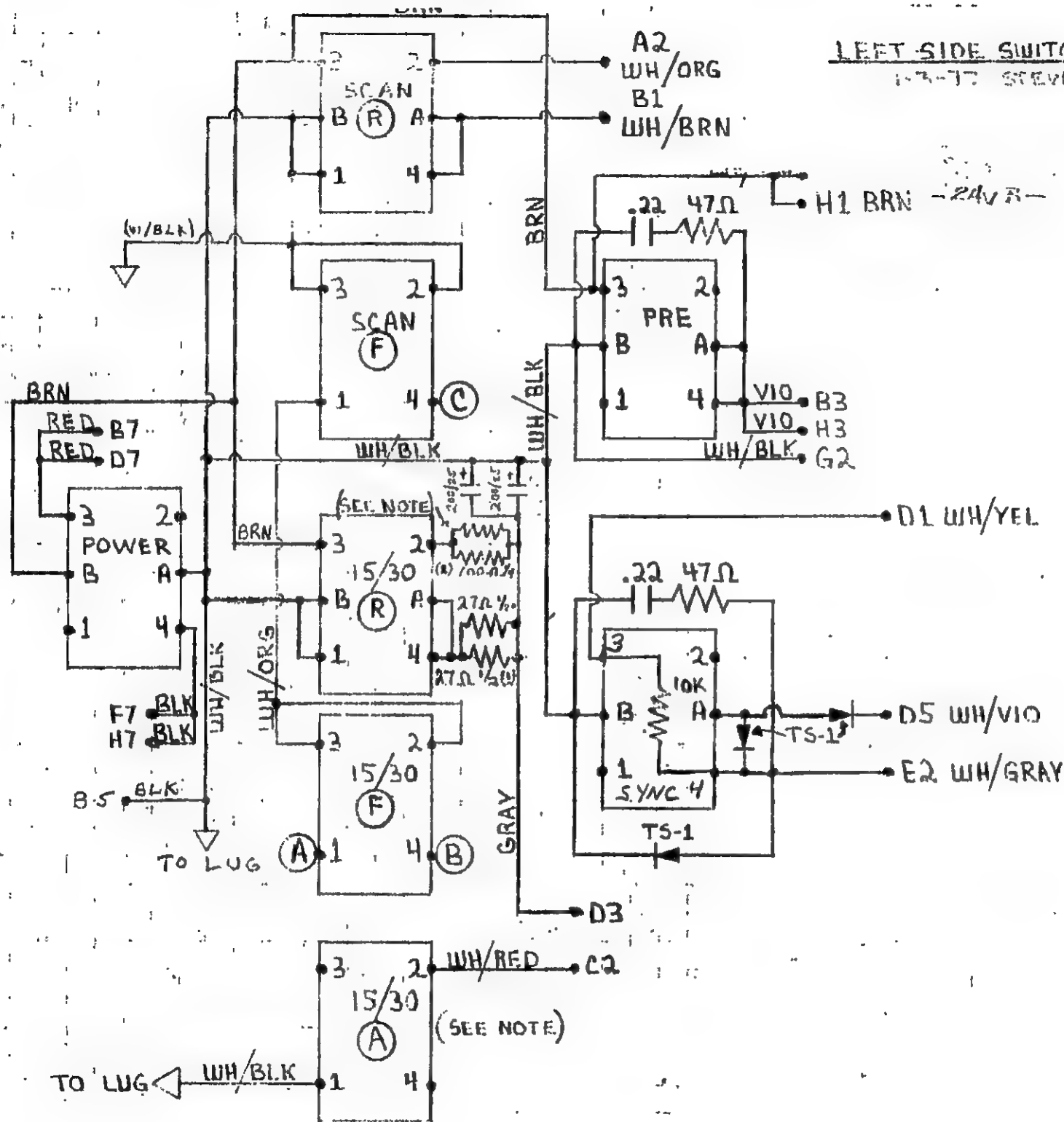
STEVENS Dolby SWITCHING UNIT



STEVEN'S DOLBY SWITCHING UNIT



TO 'LUG' ← WH/BLK



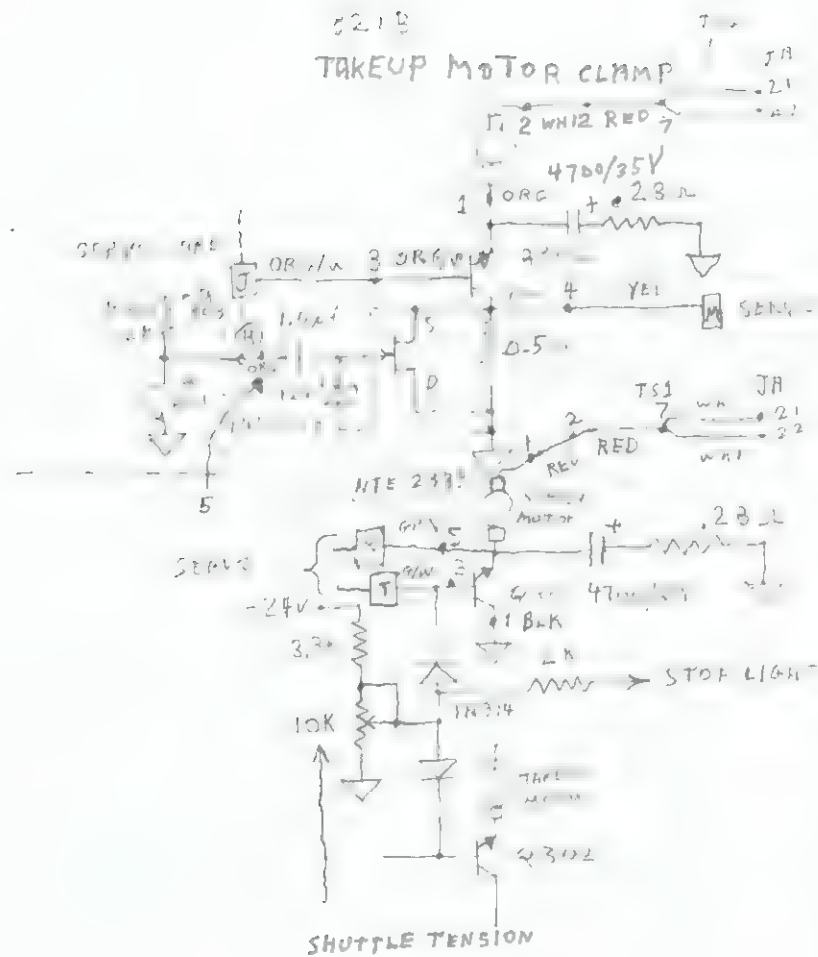
K1 MASTER RECORD PIN 6
TURNS ON BIAS (BIAS CONTROL) THEN
22 Ω (OR LAMP) WITH 390 Ω IN PARALLEL
TO BASE OF 2N3702 (Q506) - HAD
- 8VDC ON IT

2 OUT OF 3 CHASSIS HAVE SLOW
BIAS SHUT-OFF

1) How Do We Slow Down Record Drop
CIRCUIT

2) How Do We ~~Slow~~ Kill Bias Osc.
QUICKER \rightarrow 1 1/2 - 2 SECS.

T
J A
— 21
= 21



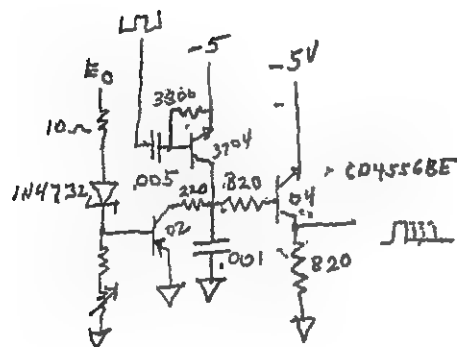
KYPCRIA.NET

JUSTDIODS.COM

63MS,

B
C
D

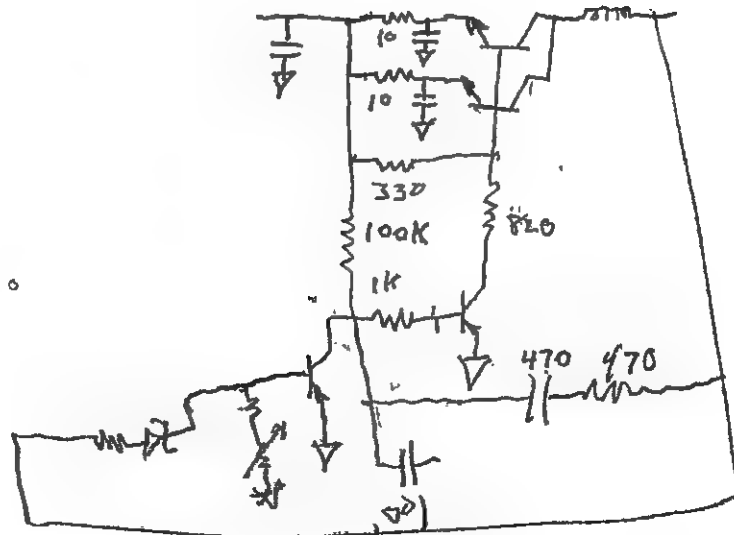
300V 350V



Z/C125B

C163B

C131B



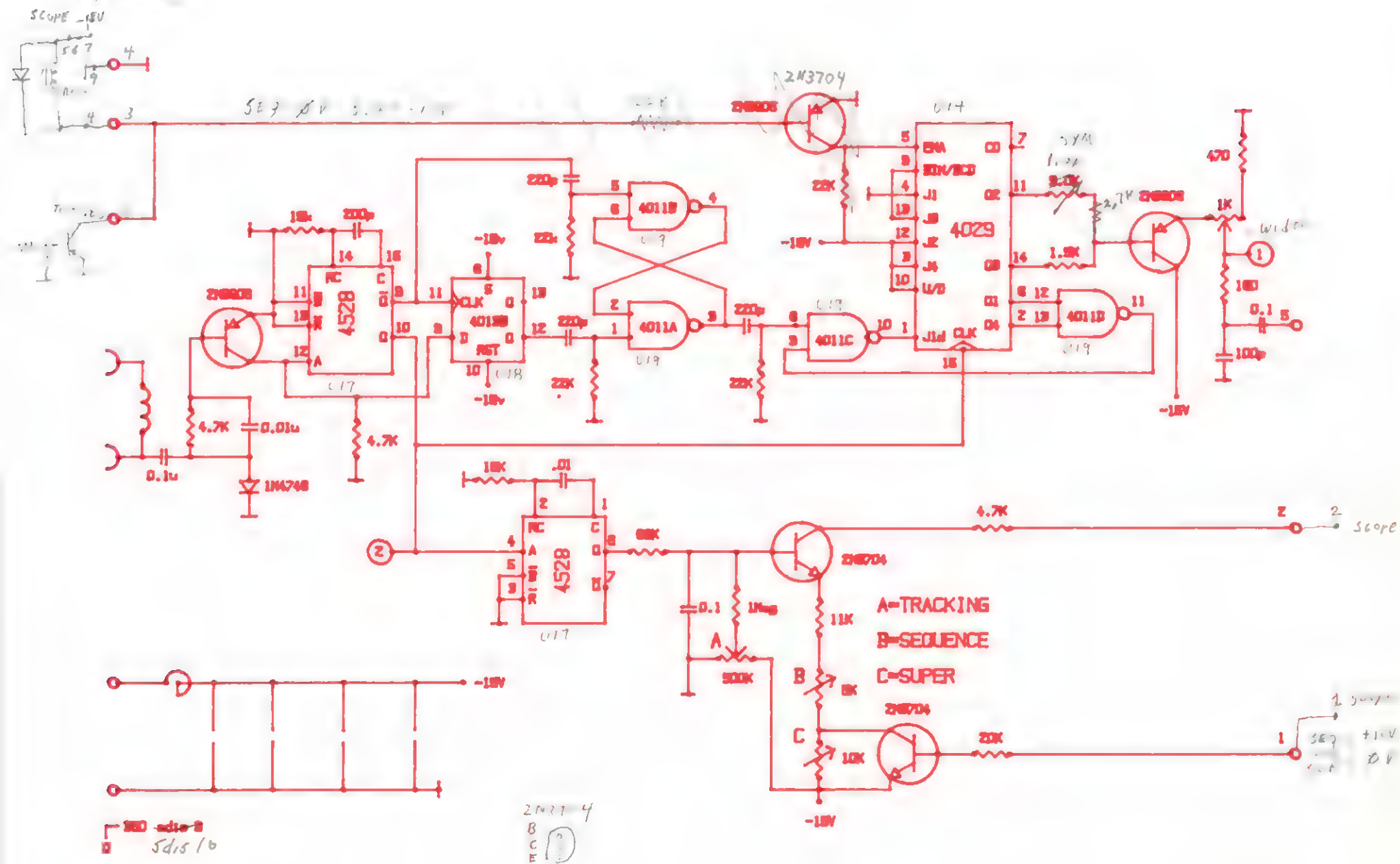
53282
44.50

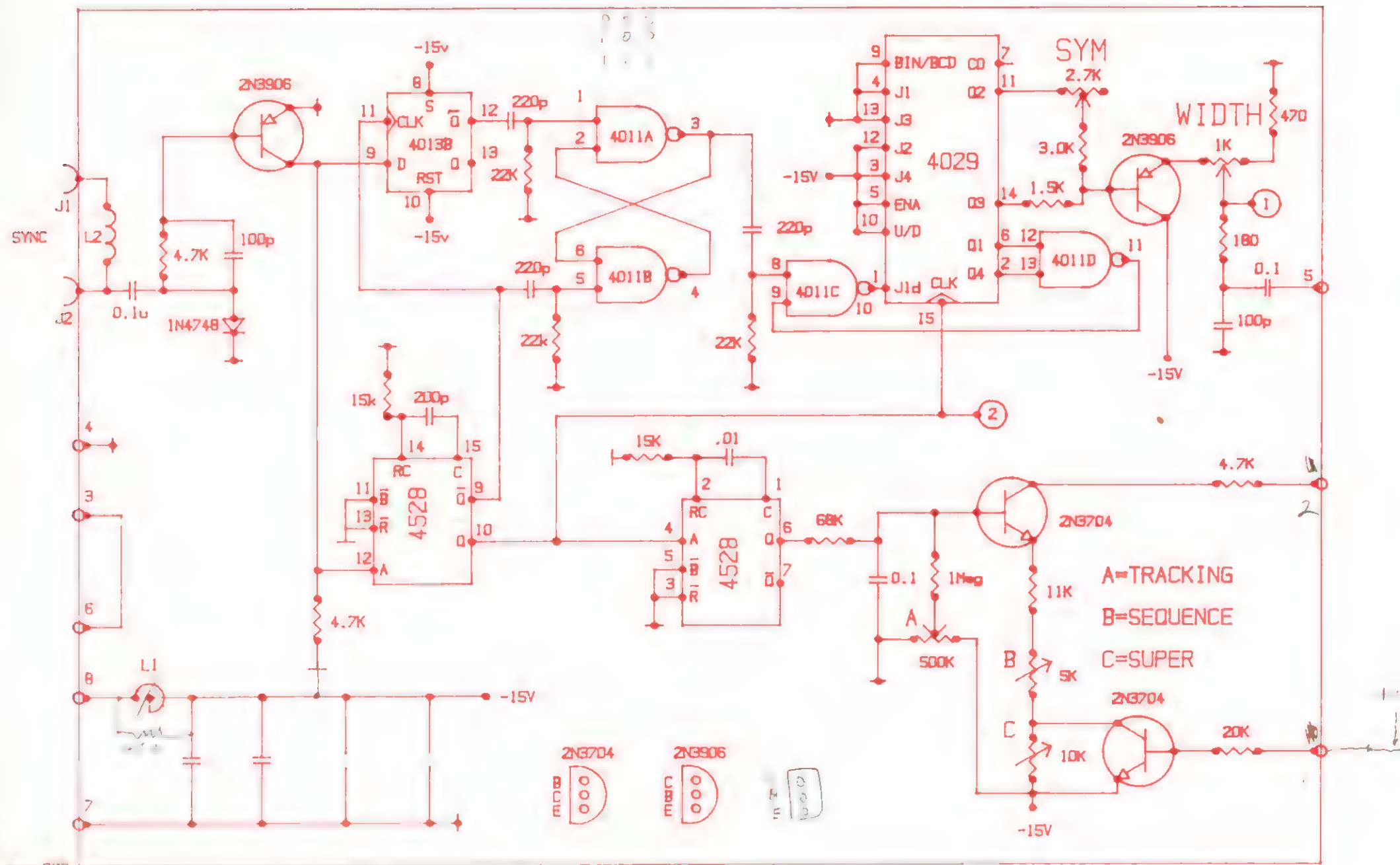


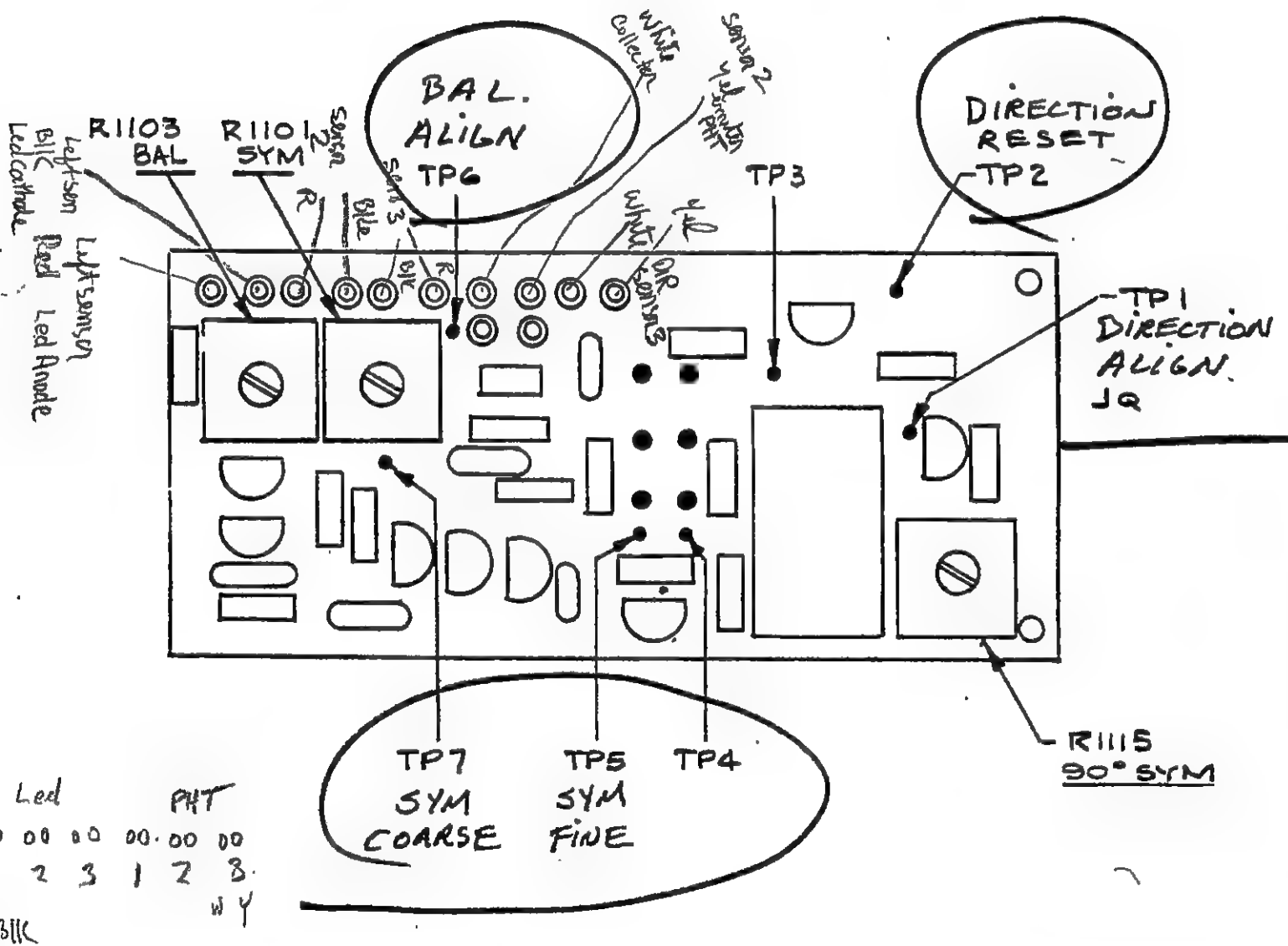
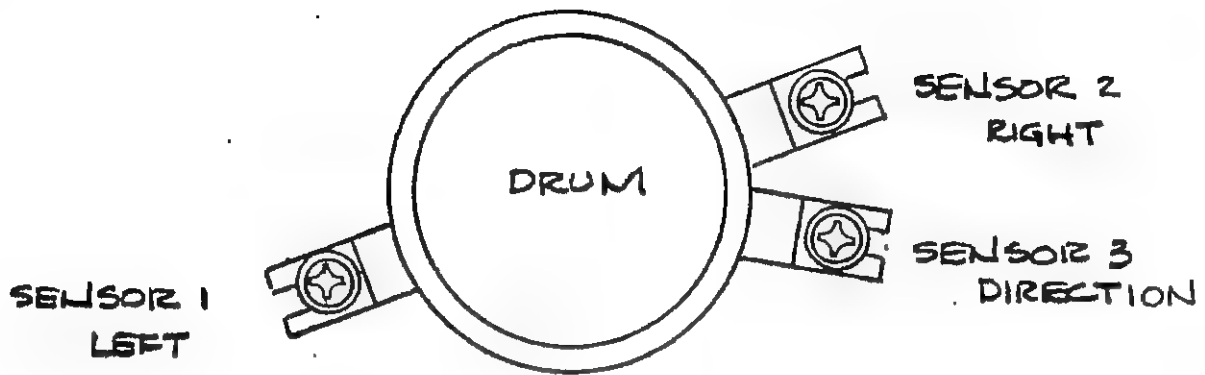
25520 W. Ave. Stanford Unit 307 • Santa Clarita, CA 91355
(805) 295-0760 • (818) 789-5237 • Fax: (805) 295-0905



YOUR POWER TRANSMISSION SPECIALISTS
GOODYEAR HOSE DISTRIBUTOR

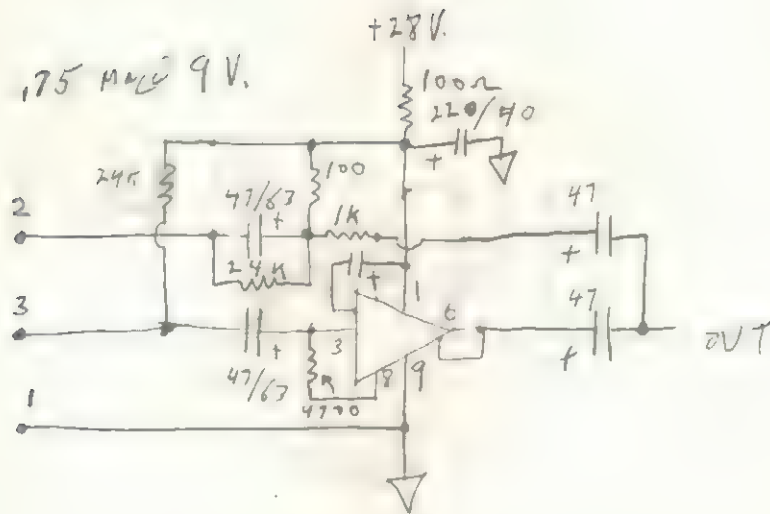






FL0M LGF

FL0UNDERGASH



#3-11

— RD
 — BLK
 — YEL

6.2k @ 48V.

OUT OF BODY
 SANTA MONICA CITY COLLEGE
 PARA PSYCHOLOGY PART I

213-692-6556
 DIANE MORRIS

PRBC 424

40170

25-500

3 374-3030-001 61.25/thous.
 10 374-3100-001 136.15/
 3 374-4035-002 109.20
 10 374-4105-002 273.20
 61-50001-022 25.40/thous.

\$100.00

Bill KAUFMANN

2000 series

N X 10.70 + 29.15

4000 series

N X 23.42 + 38.91

3 61.25 109.2
 4 71.95 / 435 135.30
 5 82.65 85.20 106.6 7.5
 6 93.35 112.1 179.7 185.70
 7 104.05 107.05 202.92 207.60
 8 114.75 126.7 226.35 229.40
 9 125.45 136.15 273.21 251.25
 10 136.15 136.15 273.21 251.25
 789.60
 11 146.85 296.64 275.20
 178.05 69.4 206.75

520

2

UNIT PRICE WITH CONTRACT 5200 = 152.08
 3.3908

25 1165. = 51.75

CLAMP TOOL # 31-118-00310 - 97.00
 EXTRACTION TOOL # 22-118-00060 - 8.50

BILL KAUFMAN -
Wicked Wanda ANDREWS -



Stephens Electronics Inc.
3513 Pacific Ave.
Burbank, Ca. 91505

Attn: Mr. John F. Stephens

☐ MALCO/Montgomeryville
Montgomeryville, Pa. 18936
(215) ~~628-3600~~ - 699-5373 - **BACK PANELS, TERMINALS**

☐ MALCO Mandex
2614 W. 48th Street
Chicago, Ill. 60632
(312) 254-4200 **TERMINAL STRIPS AND
HARDWARE ON PHENOLICS**

☐ MALCO/South Pasadena
220 Pasadena Ave.
South Pasadena, Ca. 91030
(213) 682-3351 **RECTANGULAR, COAX, CIRCULAR
CONNECTORS AND CABLE PRODUCTS**

Date: Sept. 21, 1978

Literature Sent: U-Mate brochure, Circular catalog
U-Mate samples

Jack BERMAN
649-6111

Thank you for your interest in MALCO and the MALCO product line. The literature you requested is enclosed.

Should you need additional or applications assistance, please contact your local MALCO representative (list enclosed) or the applicable MALCO facility above.

We look forward to serving you.

MALCO, A Microdot Company

GARY

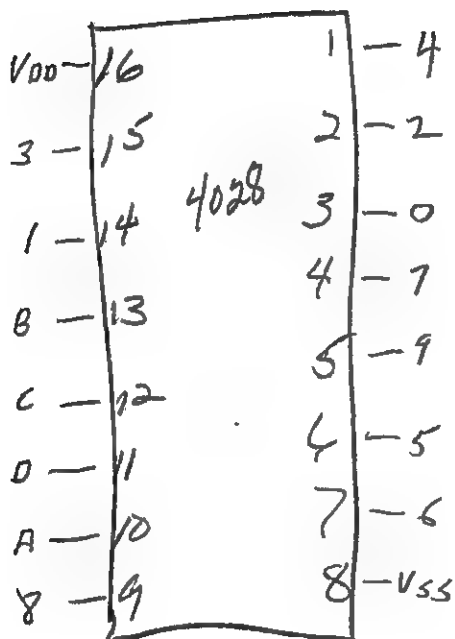
AVNET - 213-558-2345
714-754-6111

RECEIVED SEP 25 1978

ELECTRONIC
STONE

T.L.I

SEND - TIS 73



SWITCHER -

25 PIN CONNECTION

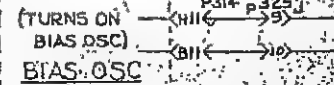
TIE TO MAIN CHASSIS

10 PINS

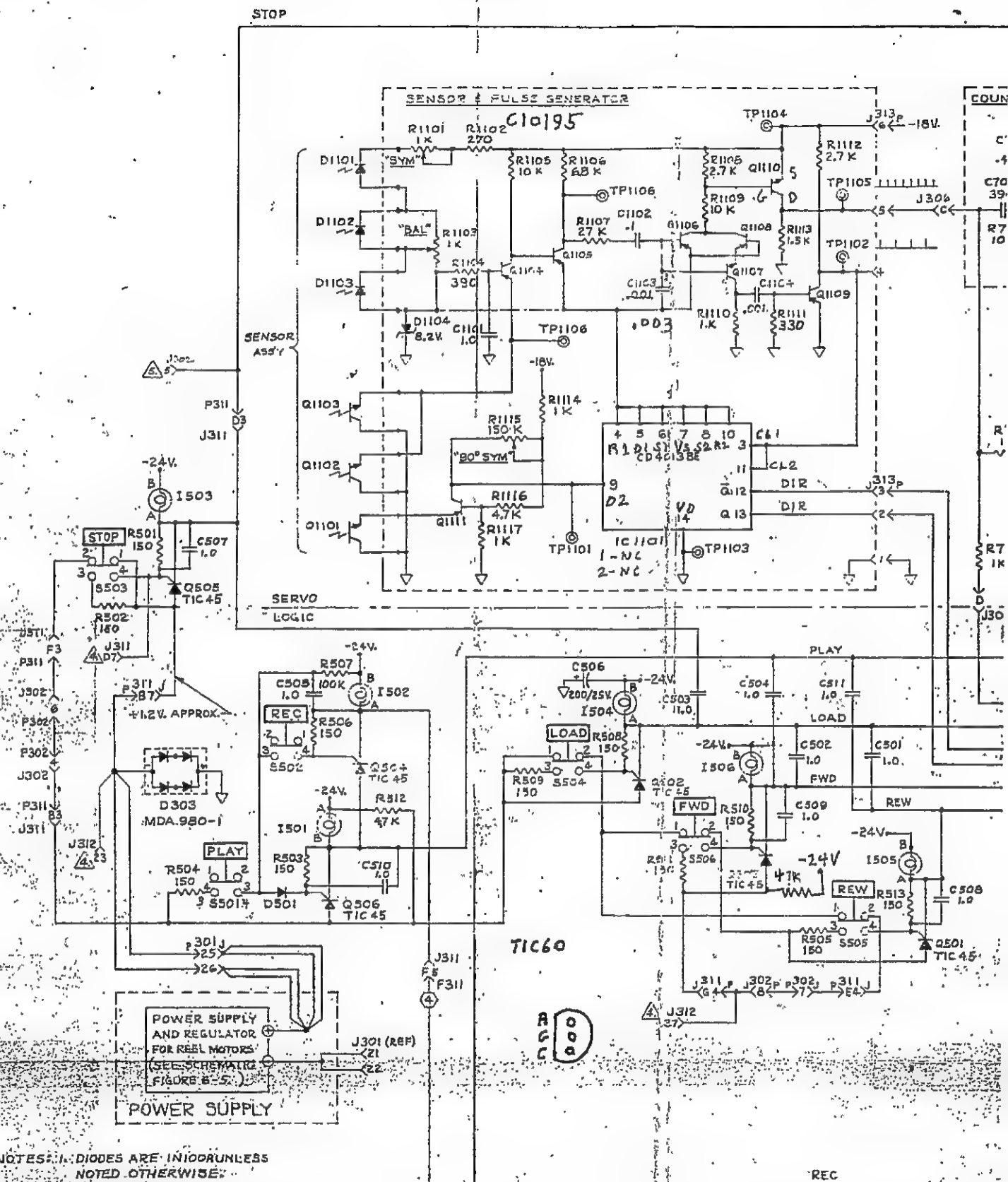
REMOTE TALLY

10 PINS

STOP



UPGRADES 02.03.02



NOTES: 1. DIODES ARE IN/OUT/UNLESS NOTED OTHERWISE.

2. TRANSISTORS SHOWN ∇ ARE 2N3702 UNLESS NOTED OTHERWISE.

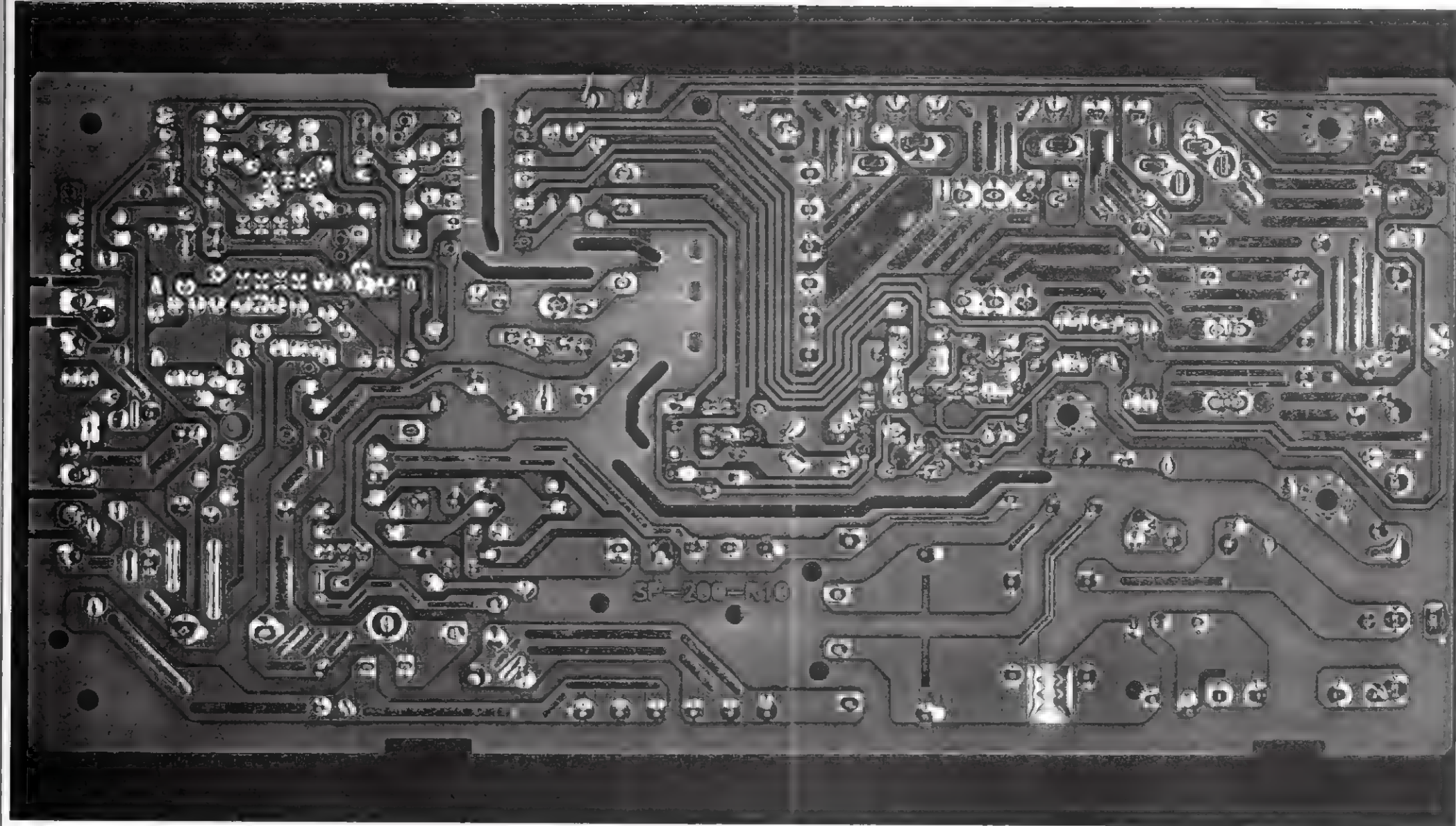
3. TRANSISTORS SHOWN ∇ ARE 2N3704 UNLESS NOTED OTHERWISE.

Δ TO AUTO-LOCATOR COMPUTER CONNECTOR J312.

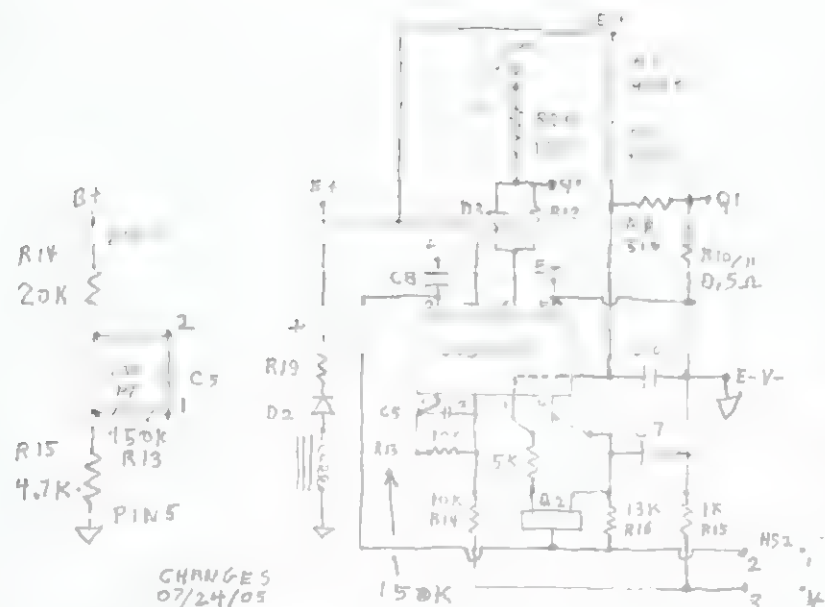
Δ TO REMOTE CONTROL CONNECTOR J302.

TIC 45

(TURNS ON BIAS OSC) BIAS OSC



SP-200-R10

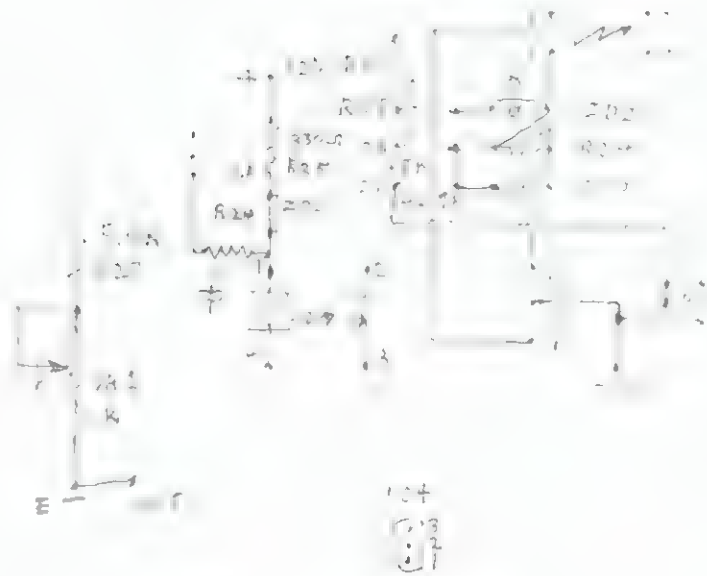
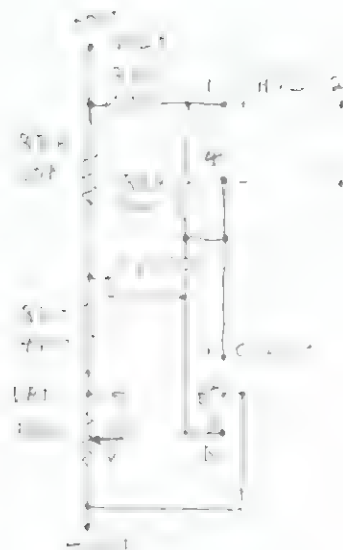


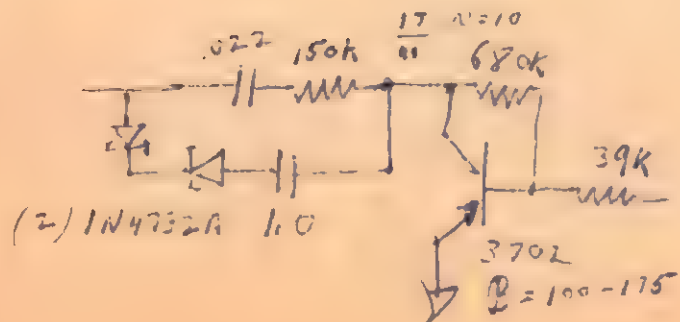
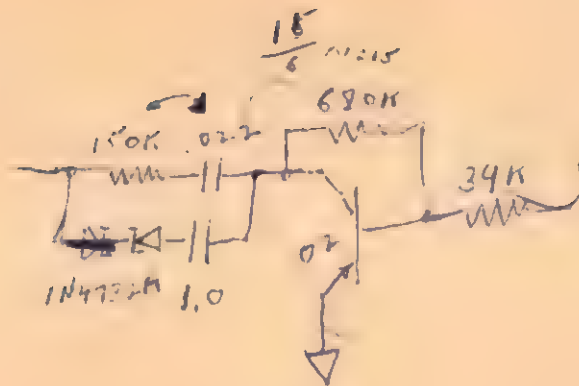
CHANGES
07/24/05

REMOVE R14

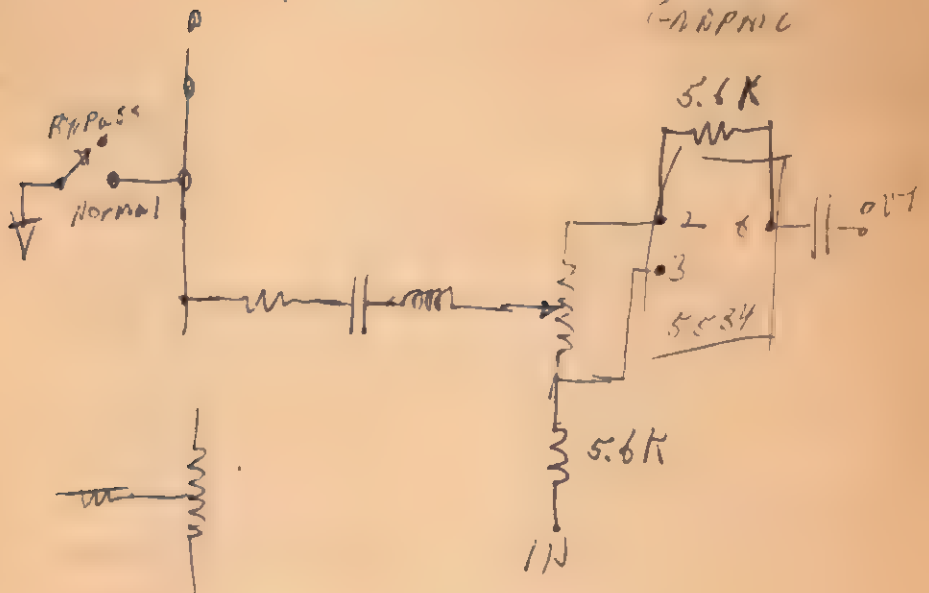
SOLDER 22K RESISTOR
FROM IC PIN 2
TO IC PIN 7
(R12B)

V	R24	R25	V	R26
12.0	3.0K	200	12.0	20K
15.0	3.0K	330	15.0	22K
24.0	3.0K	330	24.0	47K





KLARK-TEKNIK DN27 (GADPNC)



Z-71-6906

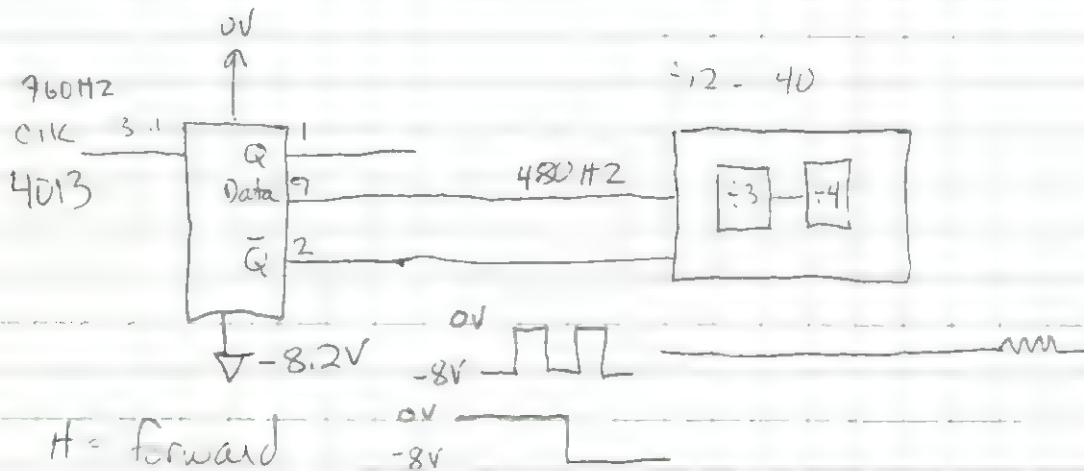
-24V from Volt Supply

→ To agree

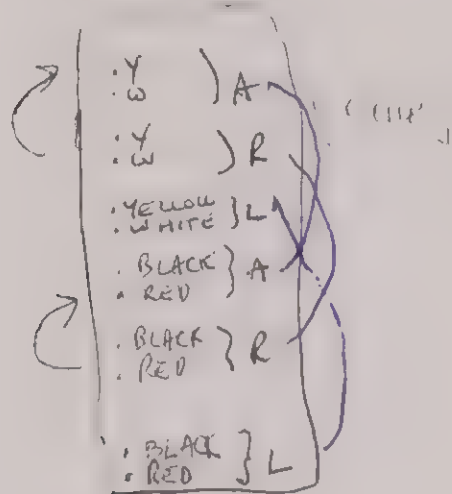
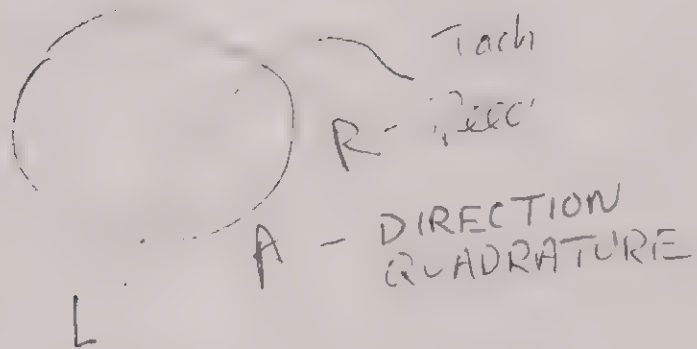
1. 2. 3.

6117

$$960 \div 3 \div 8$$

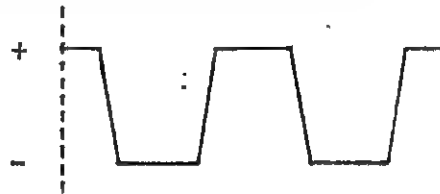


H = forward



FRONT

12. Rotate Sensor 3 so that the scope trace starts with half of the positive portion of the square wave.

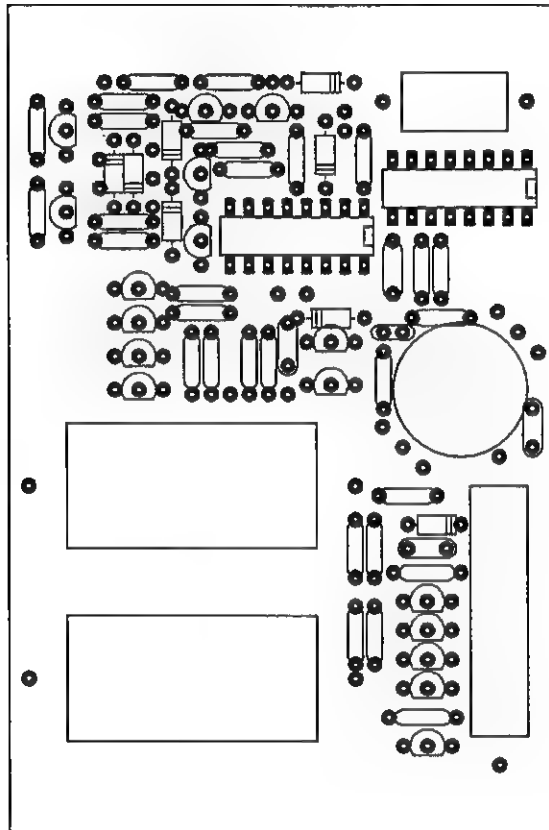


13. Run deck in rewind mode. The left side of the scope trace should now start with the negative portion of the square wave. If the slope of the square wave shows at the start of the trace, readjust Sensor 3. For better clarity of waveform, increase scope sweep speed.

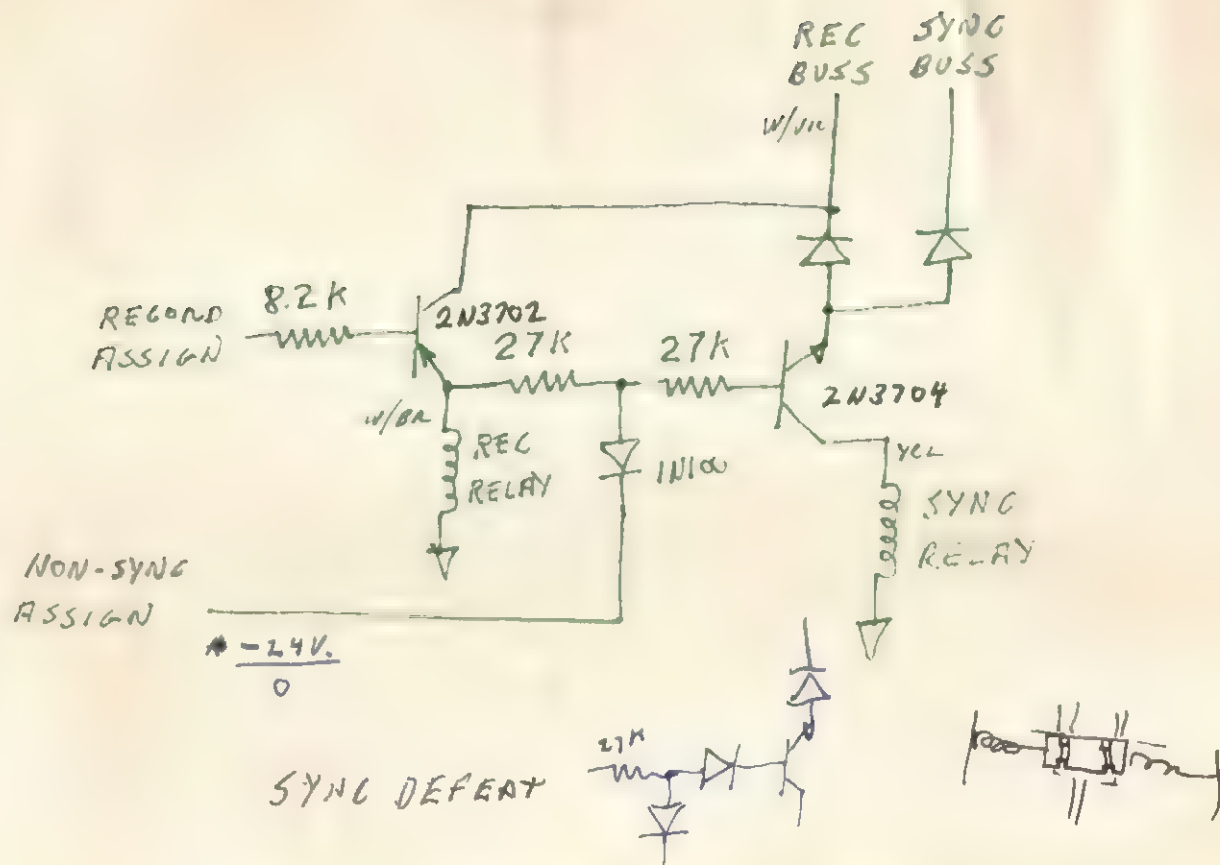
14. Run deck in fast forward mode. Trace should start with the positive portion of the square wave during acceleration and deceleration. If the slope of the square wave shows at the start of the trace, readjust Sensor 3.

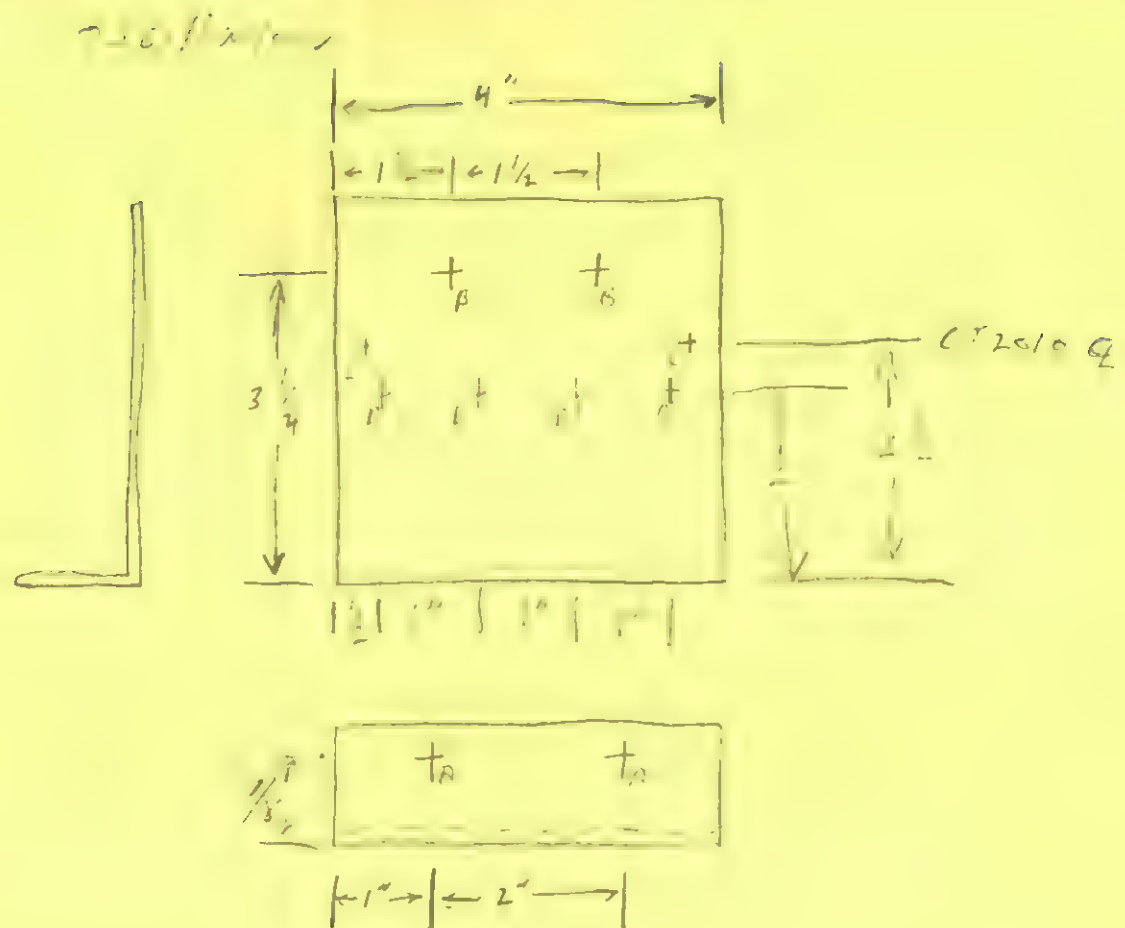
Sensor alignment is complete when, with deck operating at any shuttle speed in either direction, scope trace starts with no slope showing.

11-17-79 JFS



UPDATE 11-11-71





A = 3/8" hole

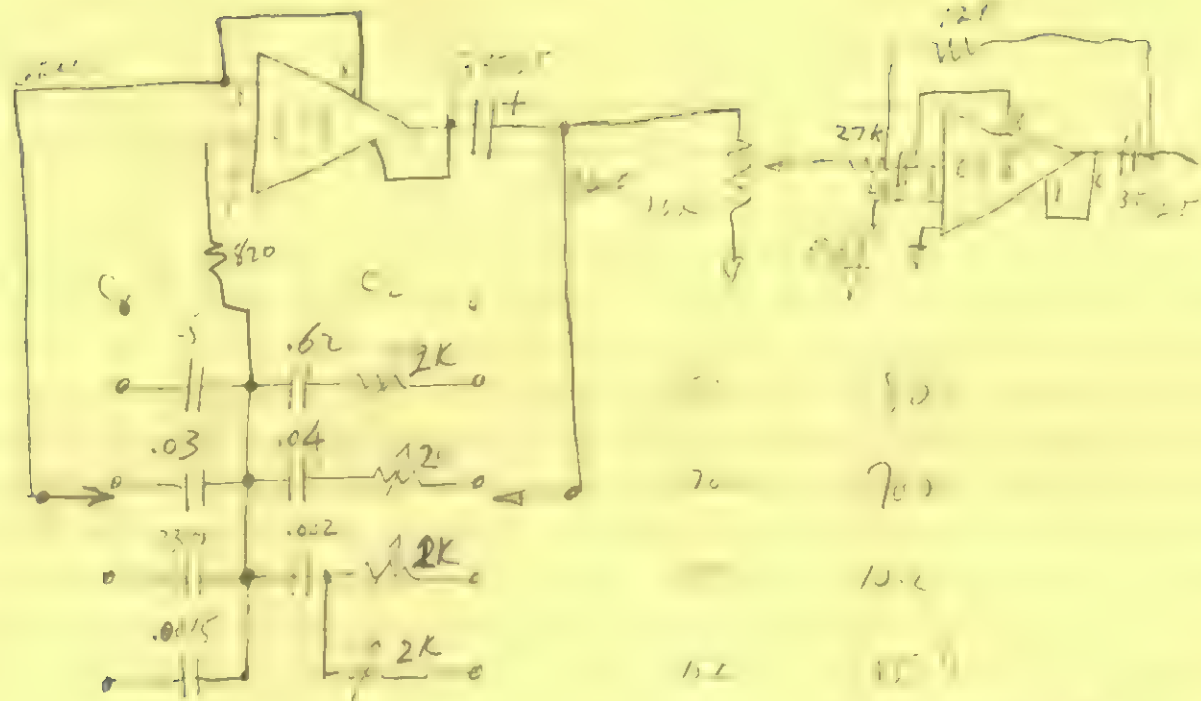
B = 3/4" hole & mounting holes for socket

C = 6-32 hole

D = 1/4" hole

7/28/70

7/29/70



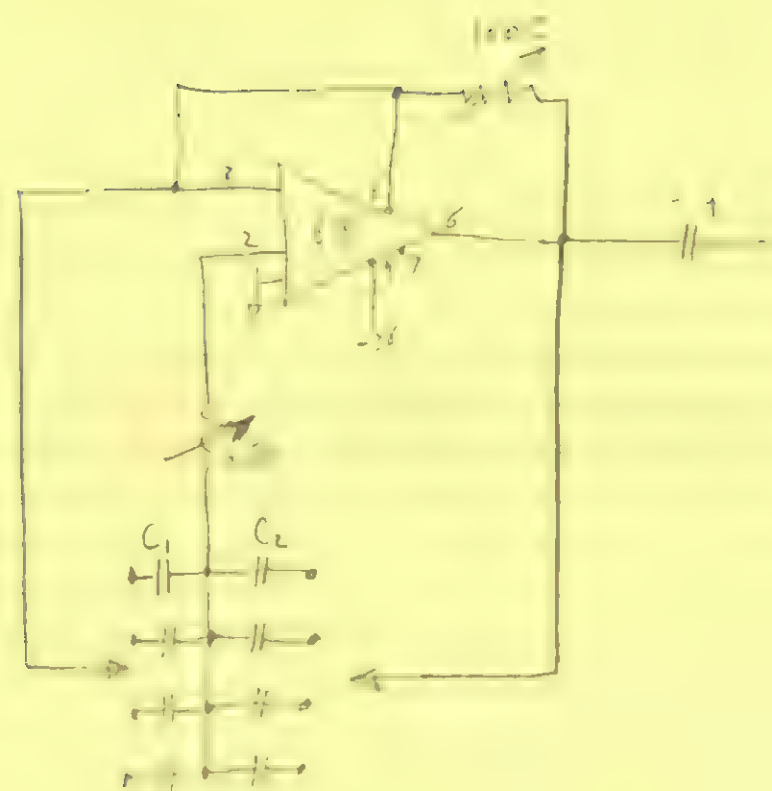
C₁ C₂
 .47 .575
 .033 .0403
 .00315 .00202
 .00122 .00202
 R
 1.7K
 1.5K
 750
 1.2K



3 POLE 5 POSIT. SWITCHING
 OAH 399224

OSW/1001

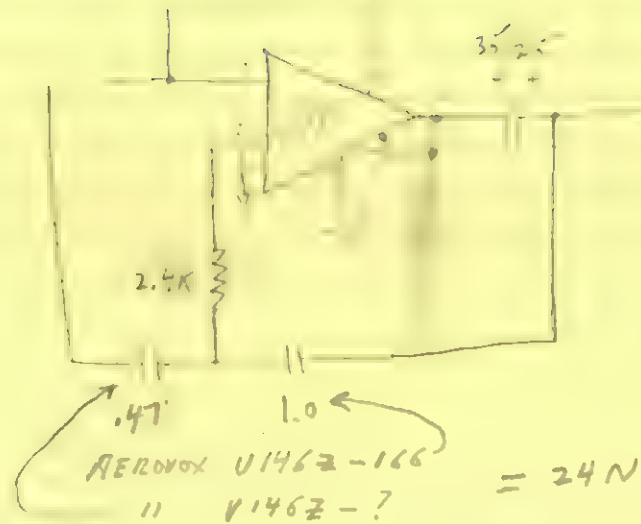
9/18/70

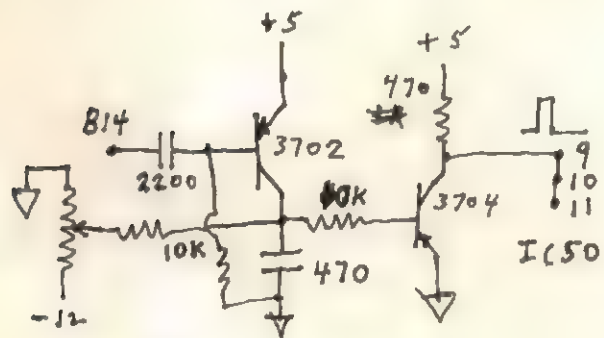
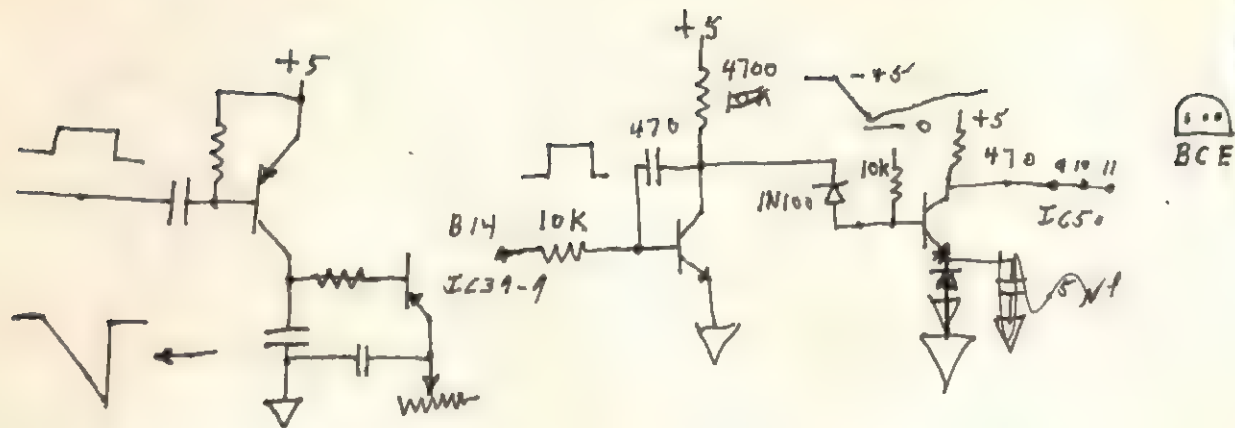


$f_{req.}$
 50 cps
 7000
 10 KC
 15 KC

20 cps Oscillator

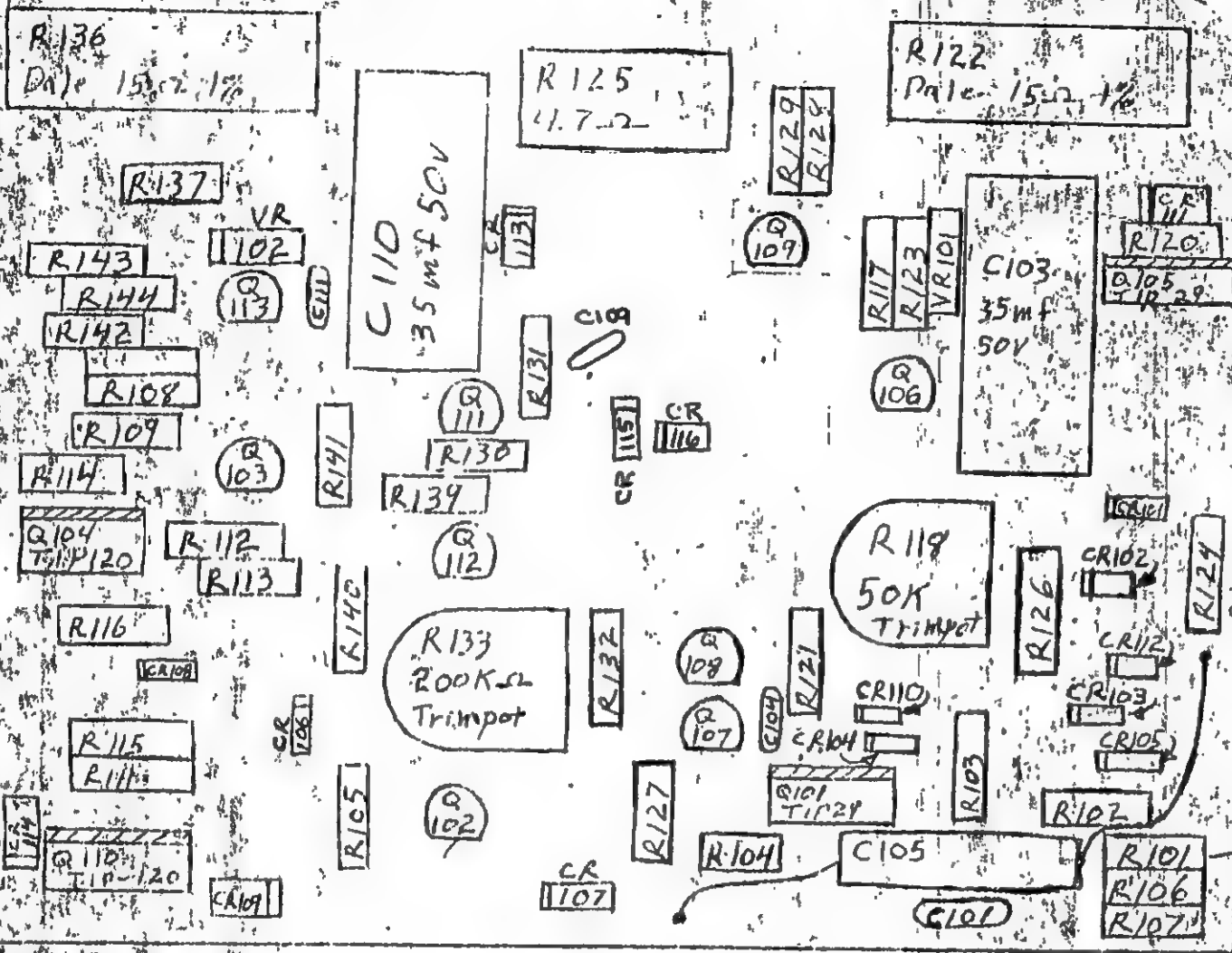
9/18/70





10297

END N.C. PLAY PRE PA C.A. GND EFSECE TRAP LIF COL 422 50 C.A. ANTINL EMIT4 GND B BASEC. COL QIC SERVOIN FST FWH LOAD B REWIND ACTION



Servo Card
with anti-hunt
modification
April 6, 1977

1000 DISPE
ON 10H DECK

STEPHENS ELECTRONICS, INC.

SCALE 2:1	APPROVED BY:	DRAWN BY PKW
DATE 10/10/74		REVISED
Servo Card # 310163		DRAWING NUMBER 310163

2/3/76
Dawson

2/3/76

Light from led A1 biased by R6
(R1 & R2 no longer used) goes thru tach
generator disc into phototransistor (A1),
thru cap C1 to XSTR Q32 and into Q33. (4) (5)

Signal then goes thru C2 to coincidence
counter Q34 and Q35 which eliminates spikes. (6)
WAVE SHAPER

? Signal Then goes to freq. doubler Q36 and Q37 (6)?
which doubles 480 Hz to 960 Hz at 15 IPS. The
output is labeled (7) on print.

Here the signal splits; one side goes down to (10)
countdown ~~to~~ circuit. IC-1, and the other
side (2) goes down to the converter, and to the anti (8)
hunt circuit.

~~The Freq. to Voltage converter Q11,~~

The 960 Hz signal goes to test point A. thru buildout
R8.

RT. BOARD.
The 960 Hz signal goes to the freq. to volts converter (8)
thru in PTH card pin 5 (at hand board,)
and thru C15 to Q11 where ~~to~~ precision
cap. C16 is charged. This is the sawtooth
waveform generator.

log 30 The discharge rate of C16 determines the play speed of the machine and ^{motor}

The discharge ^{rate} of C16 is controlled by the three sets of resistors R28, R29 for 60 IPS, R~~28~~30, R31 for 15 IPS and R32, R33 for 30 IPS. Each of these are to ground thru selector switches.

The signal then goes thru a ^{two stage} low pass filter net. Q30 + Q31 which eliminates high freq. ~~spikes~~.

log 35 The output of the low ^{pass} freq. filter ~~produces~~ an error ~~ss~~ signal of varying DC level which feeds ^{Q12} one half of differential amp Q30 and Q31. Q12 and Q13.

ref Page 5
(log 96) Q13 The other half of the diff. amp Q13 receives its input from the phase detector via the VSO. The diff. amp has a capture range of $\pm 5\%$.

The output of the differential amp feeds pin Z - card 164, ^{THEN} thru pin F - card 163 ^{AND} feeds the preamp XSTR. Q15 which drives Q16, the motor XSTR. and the motor TAKEUP

Reference C15, line 3E goes to card 164 pin A and then up thru R82 to point 6B. This is the input to Q25.

When the tach gen is running Q 25 is shut off. This also shuts off Q 27 so that the tape lifter is inhibited when the tach gen has output (tape running). However

(20)

However when in rewind or fast forward Q 26 turns on which ?

Q 25 has many inputs. 1) a ^{960 Hz} recognition input from the Tach gen. 2) a DC inhibit signal from the load switch thru CR 25.

(20)

When the VSO is in the sync position, not normal run mode, it bypasses the output of the phase detector and uses a resistor network which supplies a DC voltage.


These two voltages are summed at the output of Q 12 and go to the input of the servo amp, Q 15, Q 16 and the takeup motor.

(14)

The anti-hunt circuit ^{Q 14,} shuts down the counter when the machine is in the stop mode. This keeps the tape lifter from operating when the capstan is made to rotate. It also keeps the motor from turning.

(19)

(20)

log 50 960 signal out of reference line 7 also goes to the tape lifter circuit. It enters ~~This line also has a test point~~  Q25 and goes to Q27 which activates the tape lifter solenoid.

After stop button is pressed the tape lifter will not ~~some~~ decenterize until the tach wheel has stopped.

log 56 The anti-hunt circuit ^{is} Q14
As more current goes thru the take-up motor, Q14 goes more negative.

log 71 Q26 is the play XSTR, and is on when play button is pushed, which turns off Q27 and turns on Q ~~28~~ ⁴³ which enables turns on the pulling motor servo and relaxes the feed motor servo.

log 80 The phase detector receives its input from the countdown chip.

log 80

The countdown chip^{1C-1} has its input from the 960 tach generator. Its output is a divide by 16, 32, ~~or~~ 64. The two outputs not needed are grounded by the speed switches.

The divide by 16 is for 15 IPS,
 32 is for 30 IPS,
 64 is for 60 IPS.

log 87

The follo phase locked loop is not yet understood.

The output of the countdown chip goes thru Q7. also

A 60 line reference signal thru an isolation XFMR. goes thru Q4 is shaped and filtered and joins Q8 thru CR 3.

Q7 output also goes to Q8 and also goes up to Q6 thru ^{RC FILTER NET} a filter (possibly 60 HZ.) and is summed with the output of Q8. and then is smoothed by C14. This signal goes to the VSO and then to the differential amp Q13.

log 96

The phase det. output feeds the meter thru Q9.

Q18 and Q19 are the rewind and Fast forward circuits.

log 108

The supply ^{reel} servo has a 2 stage preamp Q20 & Q21 and the taking reel servo has a one stage preamp Q15 however ^{it} is driven from the output of the differential amp. and has more gain there.

The slack ~~so~~ pot $R_{\text{---}}$ (200K) biases Q30 which in turn biases Q21 which in turn turns on Q22 the motor XSTR.

R. 74, the 50K holdback tension control

log 122

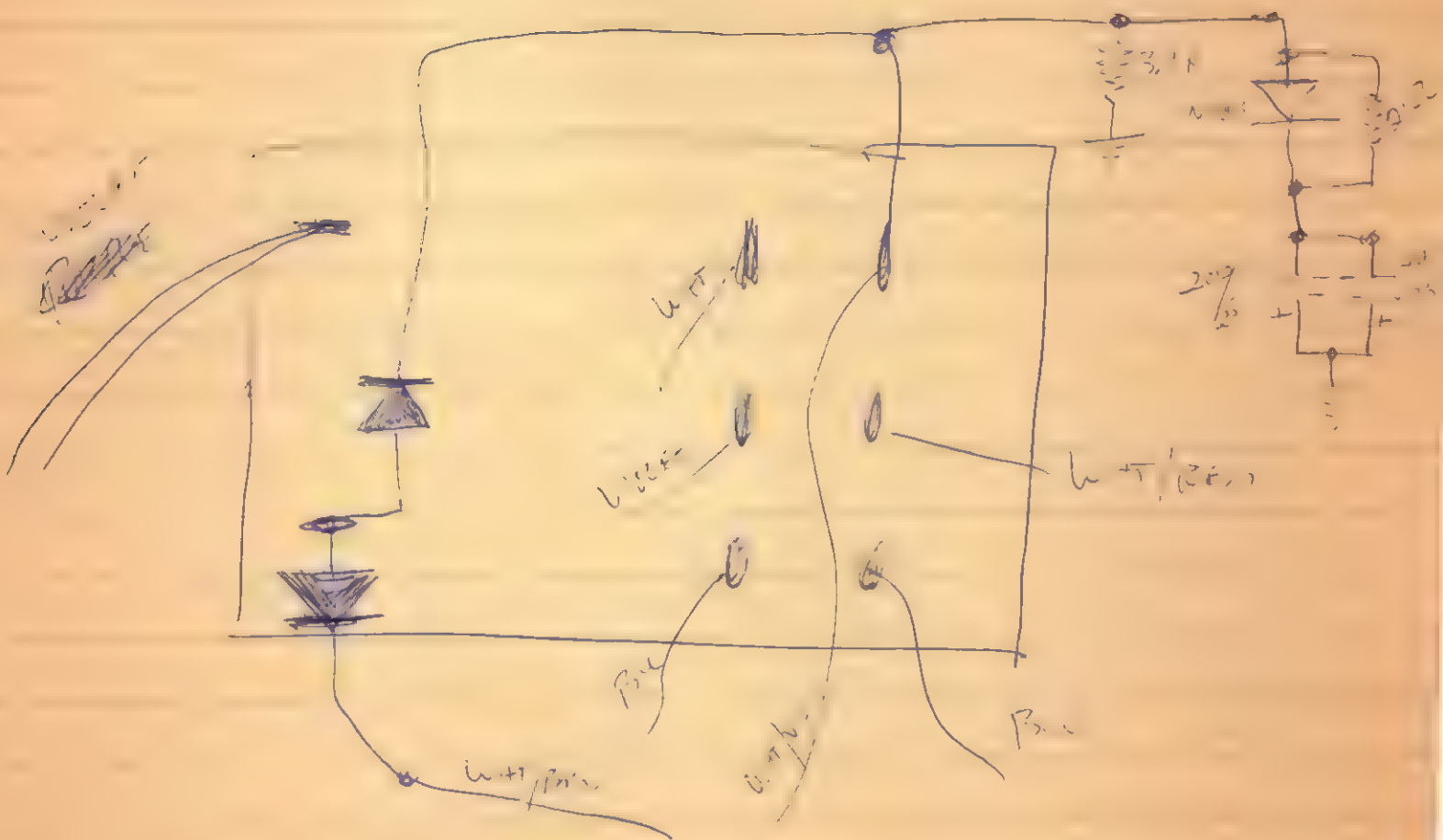
1) Biases the input to Q20 which turns on Q21 and then Q22 and provides tension on the ^{FEED} supply motor and drops the voltage ^{across} ~~across~~ R60 the 50 Watt 50 ohm resistor. This voltage drop across the 5 Ω resistor is adjusted to 10 volts and is critical.

transport ~~can~~

All Mode control functions are turned on by grounding a control line. except for STOP. LIFTING everything stops recorder.

WHY???

Amplifier Receiver Circuit



STEPHENS + 3M

16TK	8	8, 9	8, 9, 0	7, 8, 9, 10
24TK	12	12, 13	12, 13, 14	11, 12, 13, 14

3M 24TK erase 2.05MV 2.05MV 4.1MV 5.7MV 7.4MV

STEPHENS 24TK erase 2.1MV 3.6MV 5.3MV 6.5MV

3M 24TK BIAS 1.36MV 2.5MV 3.85MV 5.1MV

STEPHENS? 24TK BIAS 1.65MV 3.15MV 4.7MV 6.2MV

3M 16TK erase 3.3MV 6.5MV 9.0MV 10.5MV
5.2MV 10.2MV 15.8MV 20.5MV

STEPHENS? 16TK erase

3M 16TK Bias 1.18MV 2.35 3.5MV 4.6MV

STEPHENS 16TK BIAS 1.85MV 3.5MV 4.9MV 7.2MV

SW ASSY

2 MOLEX

SW ASSY

TKS
1-20
JA23M

TKS
21-32
JA24M

Head

1-4
↓
JA1M

5-8
↓
JA2M

9-12
↓
JA3M

13-16
↓
JA4M

17-20
↓
JA5M

REC
ELECT | PB
PREAMP
ELECT

21-24
↓

25-28
↓

29-32
↓

TO
AUDIO
PRG

ATL
motor
cards
remote
PWR. SPY

6-12-75
16TK-2

J.P.L.

16TK FEED MOTOR RUNS SLOW.

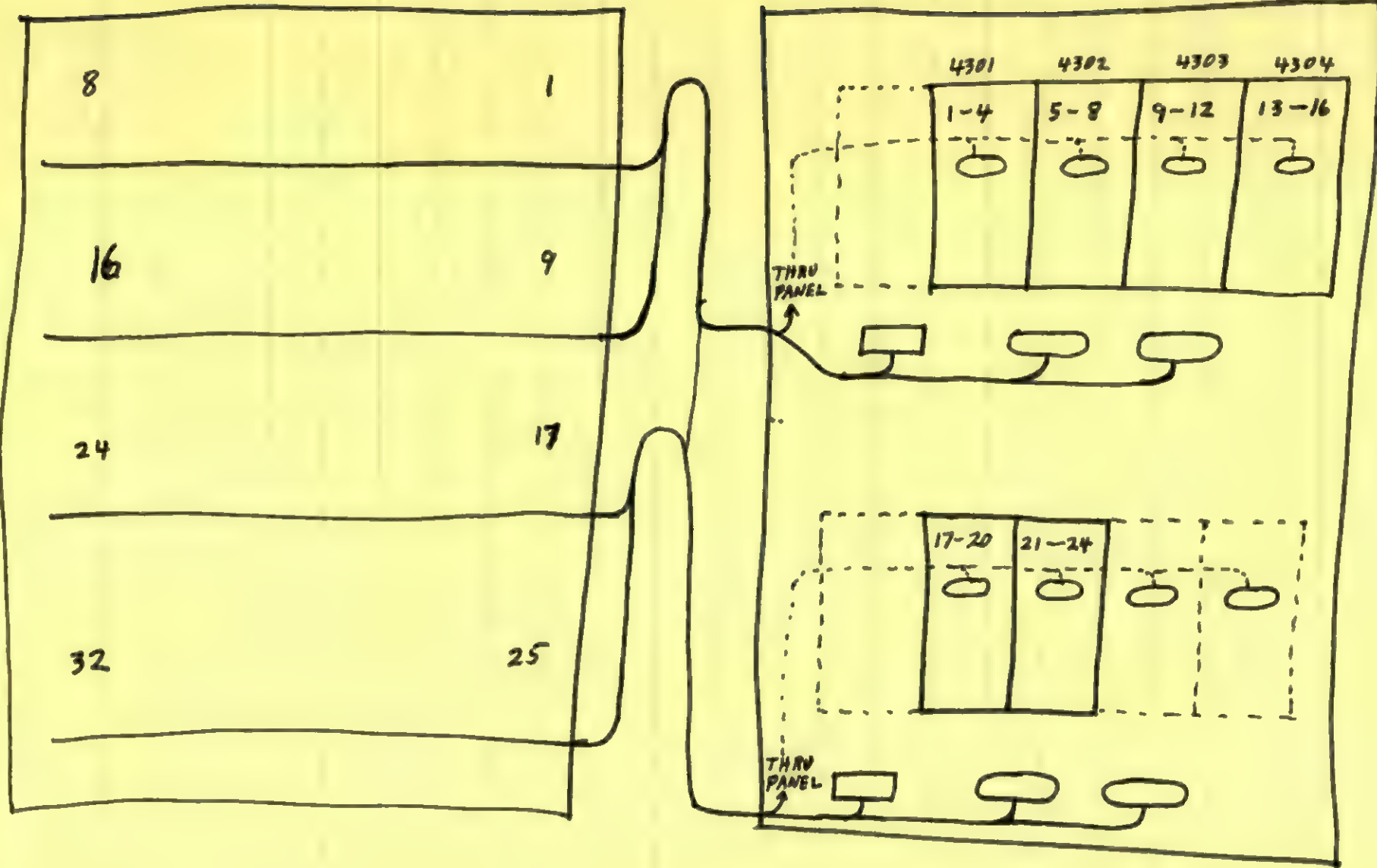
REPL. MOTOR FIELD ASSY. TESTED BEFORE, NOT
AFTER. POSSIBLE CURRENT LIMITING IN WIRES,
VOLTAGE DROP BETWEEN MOTOR XSTR. AND MOTOR.

TEST RESULTS IN TRANSPORT FILE.

(B)

A21	SUPPLY MOTOR
A22	TAKEUP MOTOR
A23	TAPE HEAD C6
A24	TAPE HEAD C0
A25	OLD POWER S1
A26	NEW POWER S6
A27	NEW OUTBOARD
A28	REMOTE CONTR.
A29	INBOARD HARNE
A30	INBOARD HARNE
A31	TRANSPORT CA
	TH
A32	TRANSPORT CAI
	TR.
A33	AUDIO INPUT/C
A34	" "
A35	" "
A36	" "
A37	TRANSPORT
A38	AUDIO
A39	POWER SUPPLY

A1	RECORD ELECTR
A2	" "
A3	" "
A4	" "
A5	" "
A6	" "
AGA+B →	
A7	PLAY LINE AN
A8	" " "
A9	" " "
A10	" " "
A11	" " "
A12	" " "
A13	MASTER BIAS /
A14	SLAVE BIAS /
A15	P.C. BOARD, LE
A16	P.C. BOARD, RI
A17	POWER + MODE S
A18	TRANSPORT MODE
A19	RECORD ELECTRO
A20	RECORD ELECTRO
	(JAGM ROL



6-12-75
16TK-2
J.P.L.

MOTOR (FEED) RUNS SLOW. REPL. FIELD ASSY (J.P.L.)

BEFORE

6-12-75

AFTER

SUPPLY

28.3V / 0.5A UNLOADED

19 V / 8.0A LOADED - $4\frac{7}{8}$ "#

TAKEUP

28.3V / 0.75A UNLOADED

20.5V / 8.0A LOADED - $5\frac{1}{8}$ "#



TAKEN FROM
4 SIDES

BEFORE MOTOR WAS DISASSEMBLED MEASUREMENT TAKEN
TO LOCATE HUB HEIGHT.

2 WASHERS UNDER EACH SIDE OF BEARING PILLOW BLOCK

PWR. SPY.: POWERTEC

VOM (I): TRIPLET 630NA

DVM (V): HEATH 1M-102

GAUGE: CHATILLON 10"

167K connector PA31M

1	A	↔	JA1M	PIN	12C
	B	↔	"	"	11D
	C	↔	"	"	3D
	D	↔	"	"	2C
2	A	↔	JA2M	PIN	12C
	B		"	"	11D
	C		"	"	3D
	D		"	"	2C
3	A		JABM	PIN	12C
	B		"	"	11D
	C		"	"	3D
	D		"	"	2C
4	A		JA4M	PIN	12C
	B		"	"	11D
	C		"	"	3D
	D		"	"	2C
5	A		GROUND		
	B		"		4 separate black wires.
	C		"		
	D		"		
6	A		JA1M	PIN	13B
	B		"	"	10A
	C		"	"	6A
	D		"	"	2A

7A	↔	JA2M	PIN	13B
B	↔	"	"	10A
C	↔	"	"	6A
D	↔	"	"	2A
8A	—	JA3M	PIN	13B
B	—			10A
C	—			6A
D	—			2A
9A	—	JA4M	PIN	13B
B	—	"	"	10A
C	—	"	"	6A
D	—	"	"	2A
10A	—	GROUND		
B	—	"		4 separate black wires
C	—	"		
D	—	"		

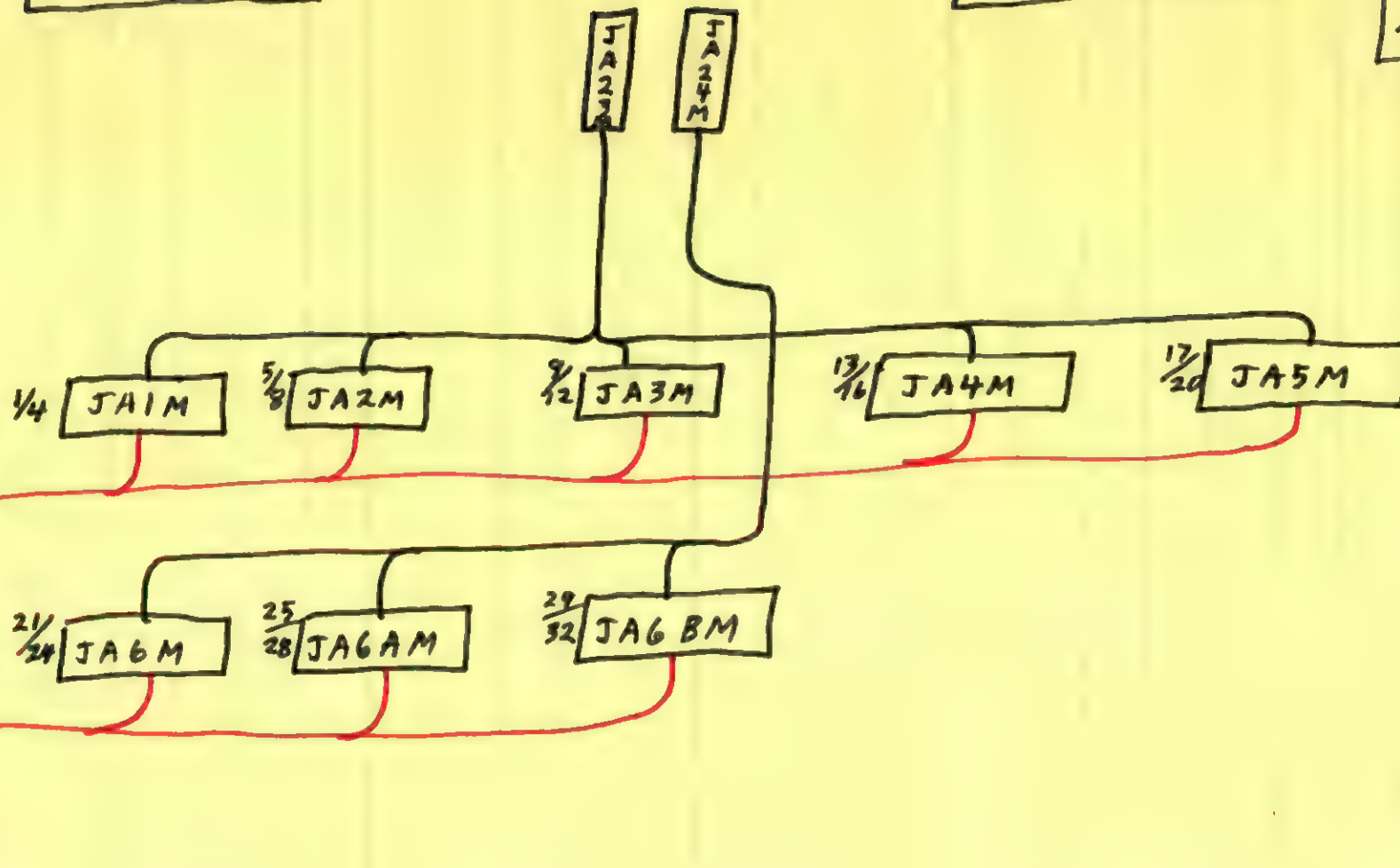
row 1 thru row 14 BLANK
NOT USED.

15A	—	Ground
B	—	
C	—	
D	—	

MODE SW.
ASSY JA17F

CONTROL SW.
ASSY

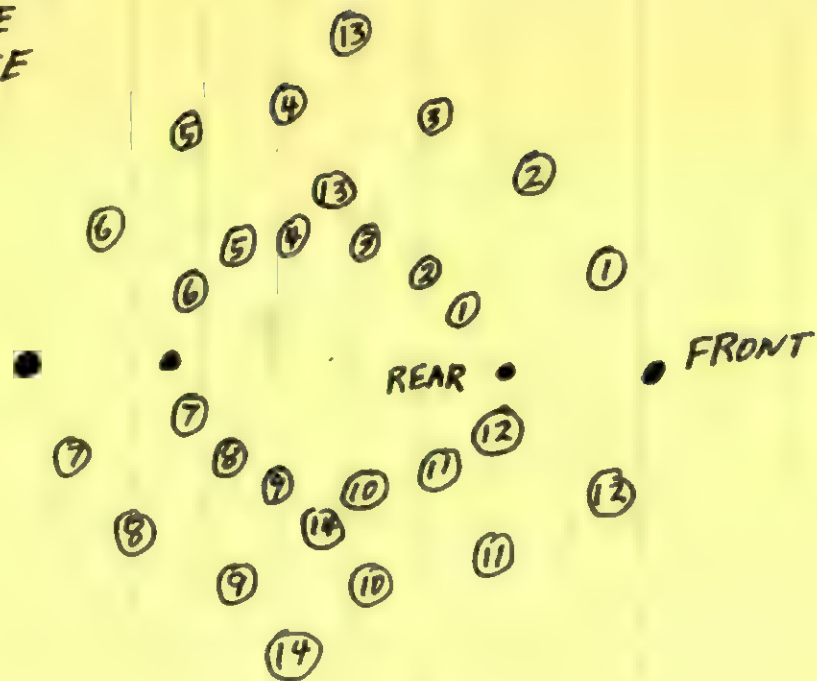
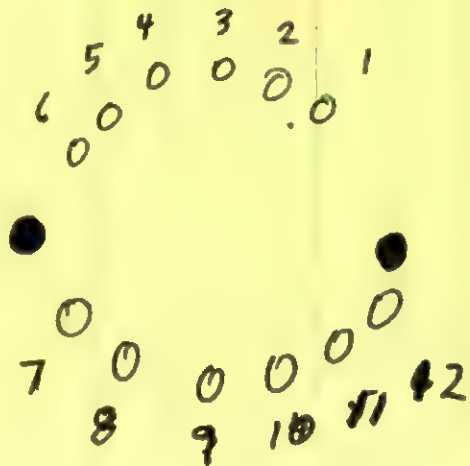
24TK
6-12-75
811D-24/32
nr 1006



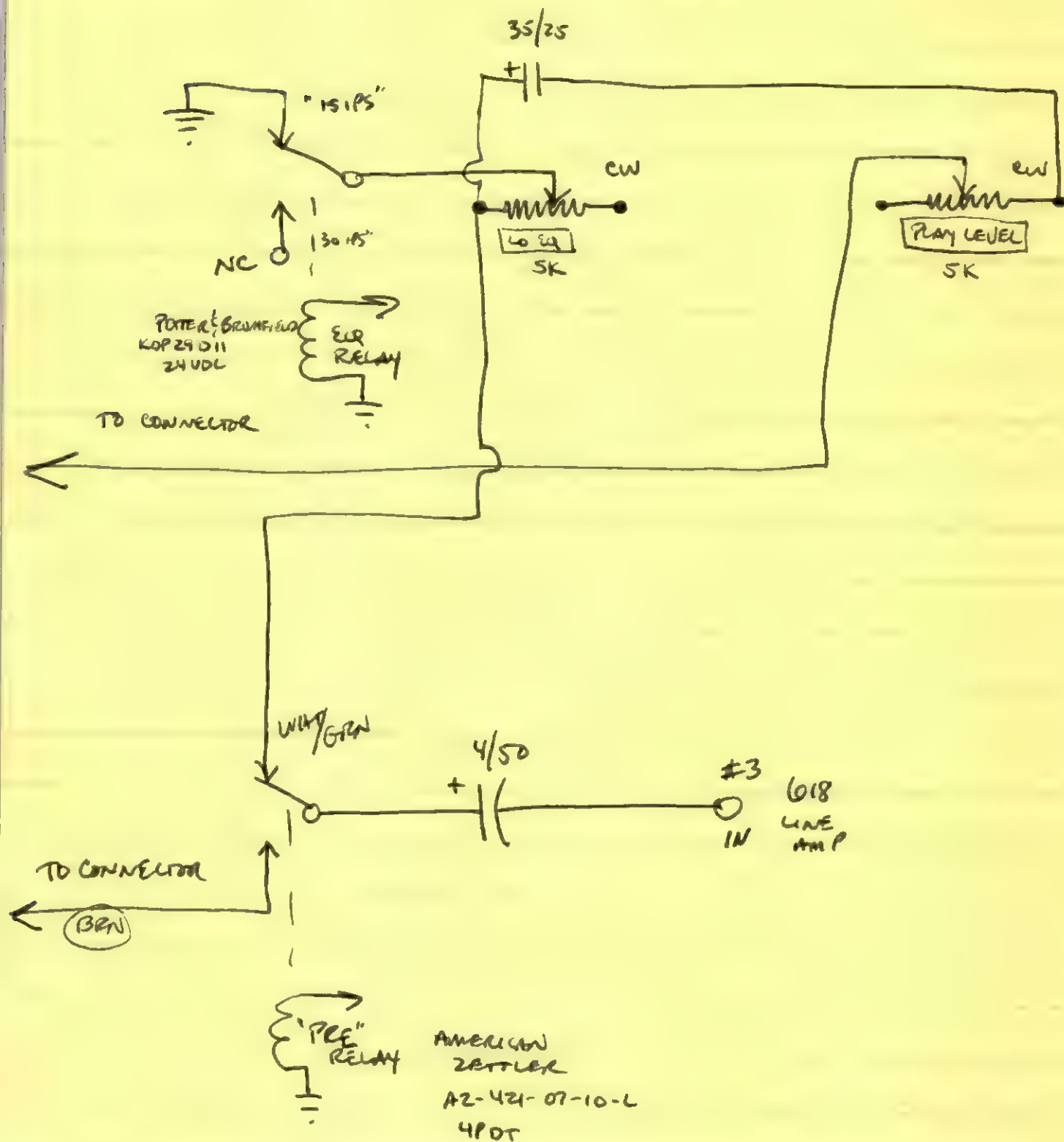
TRANSPORT
CABLE
TO
AUDIO
PHG.



① 7 PB
 ② 8 RELOAD INPUT
 ③ 9 " TAPE
 ④ 10 " MUTE
 ⑤ " —
 ⑥ 12 —



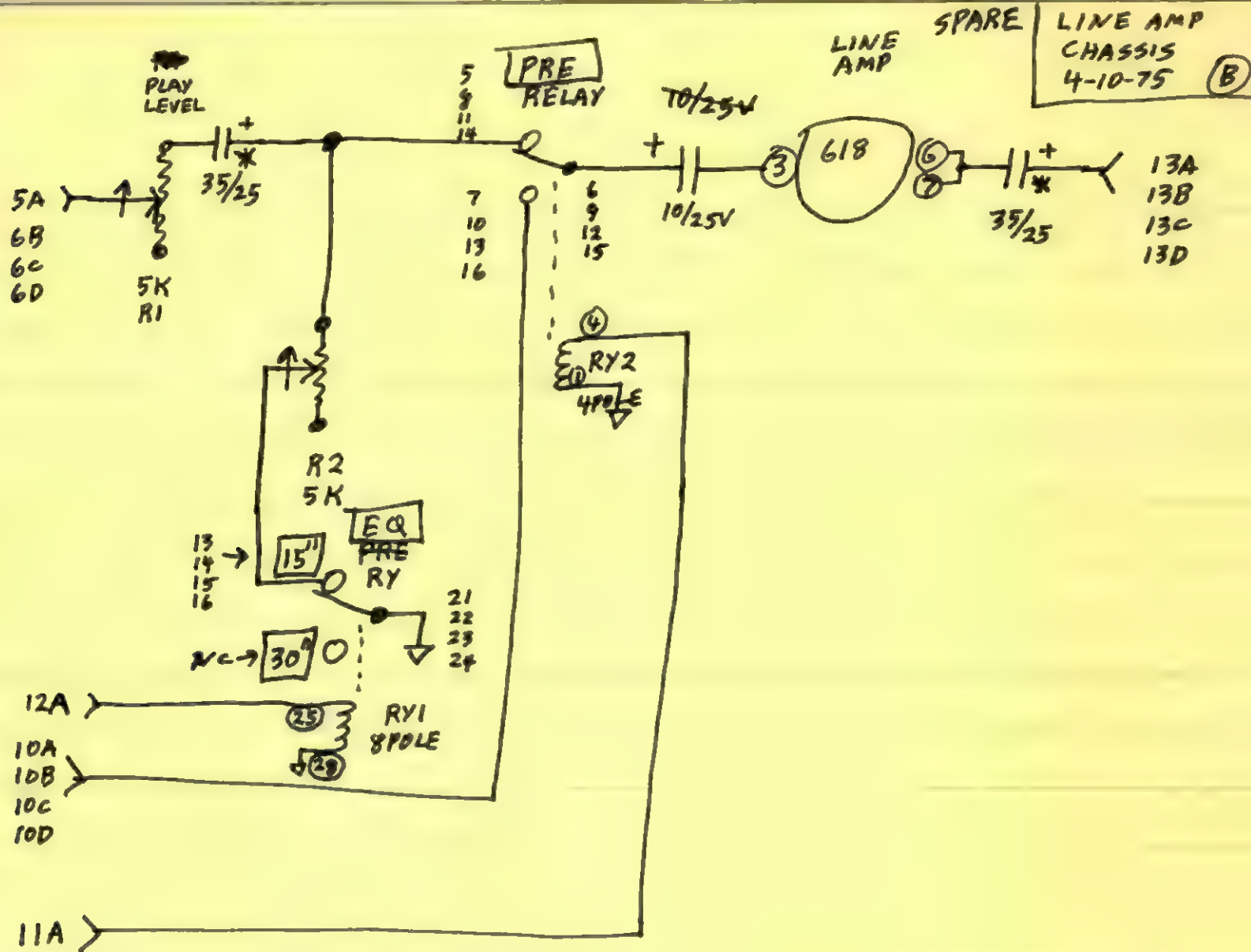
PRE RELAY SIG. PATH



TAKEN FROM ^{SPACE} LINE AMP CHASSIS

6/9/75

(JPL)

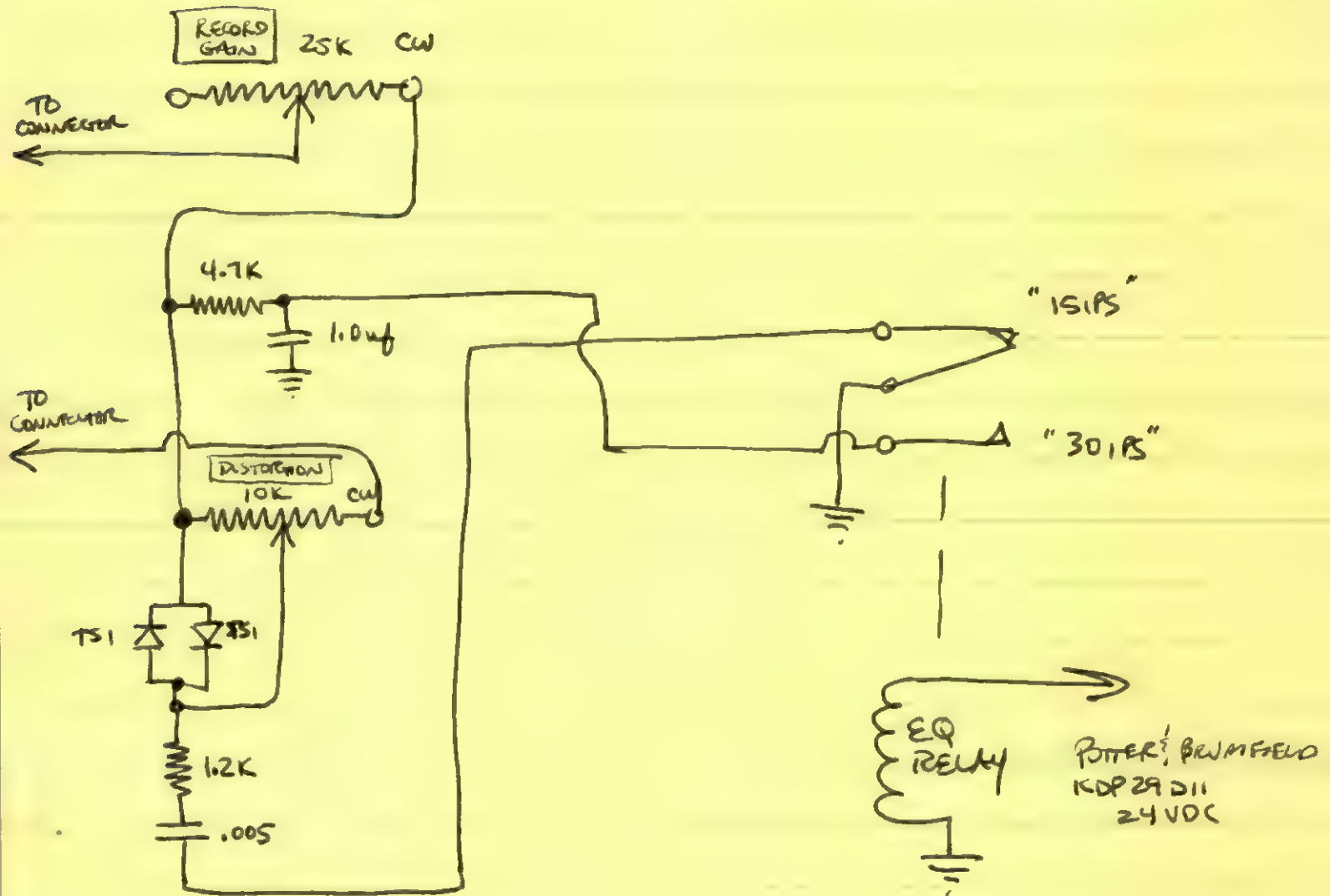


R1 5KPOT SPECTROL 48M9-5K²/140-7316
 R2 " " " " " " " " " " " "
 RY1 8POT PB KDP29 D11
 RY2 4POT AZ 421-07-10L

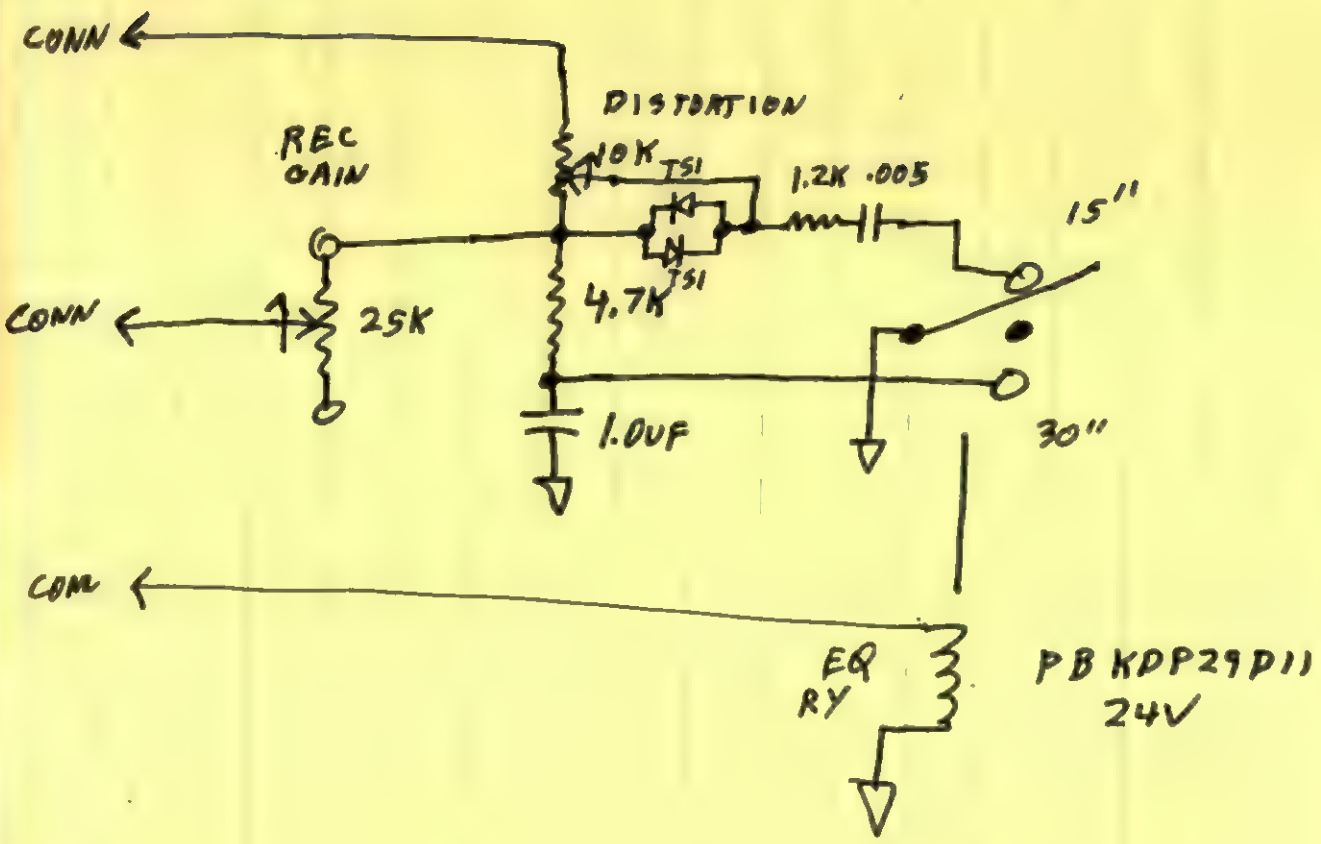
	PRE LITE	PRE RELAY (BUTTON DOWN)
STOP	ON	ON
PB	OFF	OFF
REC	ON	ON
STOP	ON	ON

EQ relay normally open at 159PS.

RECORD LEVEL AND DISTORTION ADJUST



TAKEN FROM SPARE LINE AMP CHASSIS 6/9/75 (JPL)



LEGEND →

2N3702 = "02"
2N3704 = "04"

Q:38 - 2N3702 - EXT SYNC
AMP

- Q1
- 2
 - 3
 - 4 - 02
 - 5 - 02
 - 6 - 04
 - 7 - 02
 - 8 - 04
 - 9 - 02
 - 10 - 02
 - 11 - 04
 - 12 - 04
 - 13 - 04
 - 14 - 04
 - 15 - 02
 - 16 - HEP 36C - OLD NUMBER → 2N6329

- 17 - TIP 29
- 18 - 04
- 19 - 04
- 20 - 02
- 21 - 02
- 22 - HEP 36C - OLD NUMBER → 2N6329
- 23 - TIP 121
- 24 - TIP 121
- 25 - 02
- 26 - 04

- 27 - TIP 29 - NOW IS A HEP S5001
- 28 - TIP 36C - TAPE LIFTER XISTN - NEW ADDITION - ON HEAT SINK
- 29 - TIP 30 - POWER REGULATOR ON 310164 BOARD

30 - 02 } LP FILTER

31 - 04 }
32 - 02 } - PREAMP FOR PHOTO XISTN
33 - 02 }

34 - 04 }
35 - 04 } - COINCIDENCE COUNTER

36 02 }
37 04 } - DOUBLER

IC-1

A1 LED DIODE + PHOTOTRANSISTOR
ARRAY
SENSOR TECH STRT 850A
(MODIFIED)

(1) - 10K POT

2 - 1K
3 - 27K
4 - 82K
5 - 270
6 - 2K - (not increment any more)
7 - 36K
8 - 1K
9 - 12K
10 - 4.7K
11 - 36K
12 - 12K
13 - 36K
14 - 390
15 - 12K
16 - 12K
17 - 12K
18 - 12K
19 - 1 MEG
20 - 12K
21 - 3.3K
22 - 100K
23 - 340K
24 25K POT
25 - 100K
26 20K THERMAL POT
27 - 82K
28 4.02K 10%
29 - 5K POT
30 - 24.9K 10%
31 - 7.5K POT
32 11K 10%
33 - 10K POT
34 - 3.3K
35 - 12K
36 - 12K
37 - 12K
38 - 12K
39 - 2.7K
40 - 2.7K

(2) 41 40K 10%

42 15K 10%
43 50K
44 4.7K
45 - 1K
46 - 5.6K
47 - 47K
48 - 12K
49 - 100
50 - 5.6K
51 -
52 -
53 .47K 2WATT
54 4.7K 2WATT
55 - 15K 5WATT 10%
56 - 27K
57 1.8K
58
59
60
61
62 - 27K
63 7.5K
64 270K
65 200K POT
66 - 510
67 - 2K
68 - 15K
69 - 27K
70 - 47
71 - 100
72 - 15K 5WATT 10%
73 - 1K
74 - 50K POT
75 - 15K
76 - 1K
77 4.7K
78 - 1K
79 - 2.7K
80 - 2.7K
81
82 - 22K
83 - 22K

(3) 84 - 12K

85 - 1K
86
87 - 1.2K
88 - 1.8K
89 - 1.8K
90 - 8.2K
91 - 1K
92
93 - 47K
94 - 100
95 - 150
96 - 150
97 - 150
98 - 150
99 - 150
100 - 150
101 - 150
102 - 47
103 - 150
104 - 47
105 - 47
106 36K
107 - 1.8K
~~108 - 1K~~
~~109 - 1K~~
~~110 - 1K~~
~~111 - 1K~~
~~112 - 1K~~
~~113 - 1K~~
~~114 - 1K~~
~~115 - 1K~~
~~116 - 1K~~
~~117 - 1K~~
~~118 - 1K~~
~~119 - 1K~~
120 -
121 - 200K
122
123
124
125

R110 - 47K
R111 - 22K

RESISTOR
LIST

NUMBERS NOT USED
51, 52, 58, 59, 60, 61, 81,
86, 92

KIP - 300
SIO - 400

C1 - .022

C2 - 1.0

3 - .1

4 - 200mf/75V

5 - 200mf/25V

6 - .027

7 - .01

8 - 1.0

9 - .01

10 - .015

11 - .015

12 - .015

13 - .047

14 - 4mf/50V

15 - .001

16 - .068 1%

17 - 1.0

18 - .47

19 - .01

20 - .1

21 - .005

22 - .01

23 - .47

24 - .027

25 - .1

26 - 35/50

27 - .047

28 - 150/25

29 - 1.0

30 - .027

31 - .1

32 - 200mf/25

33 - 1.0

34 - 1.0

35 - 1.0

36 - 1.0

37 - 1.0

38 - 1.0

39 - 1.0

40 - .1

41 - 35/50V

42 - 2/25V

43 - .01

44

45

C46

C47

C48

C49

C51

CAPACITOR

CHART

HIGHEST NUMBER

C43

1002	FABI
1004	FAB3
1006	FAB5
1008	FAB7
100A	FBA8
100C	FBA9

FAB3 230 1006

$$REGS = 1000$$

DC 49

	35	16
F805 =	08	02
F807 =	82	80

5

FIDE

1406 R8
1407 3F SOURCE #
1418 PF ANSWER #
1409 00
1014 PF

00 16MM
01 ~~55~~ - 516
02 35MM
03 1:1.85 (325)
07 LTRBX
0A PHNEDIT35
1A CIN35
0E LTR, PEDIT
10. P5.5AHD

02.16mm
08.35mm
10.535

LATSEED
LYNSEED

18 F77A 63354 3519
24 F99A 63898 2662
30 FAF2 64226 2140 FRUP

92D

18 F99A 1637
29 F778 2183
30 FA62

1-4281, 1-4282 F807

1565

[Faint handwritten notes, possibly bleed-through from the reverse side.]

Cluster 5, 43+
Offset 449,733, by 65

PLANG

2,711

PAD 074,018

M 51 0 0 1 0 0 SHPRC 035 0 0 0 0 0 0

M 52 0 0 1 4 0 0 SHPR 0 0 0 0 0 0

M 54 0 0 3 9 0 0 SHPR 0 0 0 0 0 0

PLAIN, GND

FE612A\ASM\FE612A

SYSTEM.INI

MINTIME SLICE=20

WINTIME SLICE=100.50

2000 1940 2800 1640

WINSTUCK.dll

WWW.Adult-UserNet.Com

1950 1800 2650 1900 0 40 34 0 1 = ISOLATED

Space_Camera.html

2010

2010

2010

2010

2010

2010

2010

2010



1/7 - 100 - 1000000000

1/6 - 27000

1/5 - 10000

1/4 - 1000000000

1/3 - 1000000000

1/2 - 1000000000

1 - 1000000000

131.9

CONTROL PANEL

-CD-

YAKOO - 301127

FIN WIPERS

cygdown

SHINY P. M. H:

2000-11-22 2:00 PM

10:00

11:00

12:00

13:00

14:00

SHUT OFF FIRE

15:00

16:00

17:00

18:00

19:00

20:00

21:00

22:00

23:00

*shoveywords)

META content="Microsoft Frontpage 4.0" name="CONTENT: /1001"

CON

-1001-

1001-1001

1001-1001

the first is a researching & developing upgrades for the FDL60

ENTER (IMG src="images/jfsicp.gif")

PC (7/1) (7/1)

researching & developing upgrades for the FDL60

jfsicp.gif

user improvements.

images\electr...

images\electr...

images\electr...

It will be interesting to see what he does with the FDL60. (7/1) (7/1)

(7/1)

Info-MRU

(GIF)

50F/50F.HTM

791115 21:33 195A
GIF

MULTI-...
MONOPUS
VS PLUS
USE

REFRAN
M. N. G.

560 TAB SIXTH SOURCE
21313
11955

(1200 FOR ONE RATE, FGS 17289.20)

HSH.COM

(CPL V)

PAGE

111M

A/AT 79/11/11

198.117.16.4
207.222.16.127

INFO
103.2 - AL

(1.11.18.11)

INCLUDING

12.12.12
23.12.12
24.12.12

AM 12

<HTML>

(Child) (Y174E) (CARRIE'S PAGE (Y174E))

Yoda Bid: 11

WWW.SOTAINSTRUMENT.COM
SOTAINSTRUMENTS.COM

<html>

760.599.3225 -

DEPT. - JOHN RUPPERT

6611A25M.TIF
2942K

+180
+200
+100

61116.TIF
61115.TIF

61117.TIF
61118.TIF

61119.TIF

512.706-3026

Original File - 6609A.TIF

6000 X 6111 2.4 X 11

12 X 5.5

X-2

1200px 800px 4411

1200px 800px 4411
1200px 800px 4411
1200px 800px 4411

WWW.FACEBOOK.COM

6611-2 TIF -> 6611819d.TIF

6611A25M.TIF

ANSI -

23.518

2,879K

3 POINTWANT LINK
J. J. NET

15.145

ABUSIB

CAUTION
1200px 800px 4411

1000 - 1000

1000 - 1000
1000 - 1000
1000 - 1000

1000 - 1000
1000 - 1000
1000 - 1000

1000 - 1000
1000 - 1000
1000 - 1000

1000 - 1000
1000 - 1000
1000 - 1000

1000 - 1000

1000 - 1000

1000 - 1000

1000 - 1000

1000 - 1000
1000 - 1000
1000 - 1000

✓ 1225 P.E. CT 11.5.90

E' 98 =

1CT

W. E. SARGENT

575

Εξ ο

860

2

20

21

E I 24

3176

5108

071 SET ✓

WDY 26005077

DAILY NOTES 74-75

12-13-74

AMC - JEAN PETERSON 2:03 PM - went home already

SHOULD CALL HER MONDAY MORN.

AMC - LES JOHNSON 2:08 PM AHS. 984-6100 NA

Home 389-7512 NA

he called & I TOLD ABOUT BOVVED CAR. - I will call him soon. NAT W/.

Reid Ball JACKSON BAKER 2:18 - IS BUYING MCI.

Relap hands? \$450.00 WANTS TO KNOW IF I can look at them.

I will call him MONDAY.

12-14-74 PSA 6:00 PM - 471 6:55

12-14-74 LOON RUSSELL - RETURNED HIS CALL. He will return in 1 hr.

I should call him. (2hrs) 1-918-742-9332

12-14-74 Chris Skene 271-9880 - 271-9829

call him SUNDAY ABOUT Repair of second dropout,
Bias Ref.

12-15-74 ... - ...
& delivery sched. of 24TRKs THIS MO.

DEAN ACHENSON - WANTS DIAG.

TOLD HIM delay of 4TRK JAN 14

WANTS SET OF SHUTTLE CONTROLS - LESS BOX. -

12-16-74 ...

delivery by 2ND JAN - for a 24TRK.

12-12- BRYAN RTN call 3:09 - WANTS TO PAY OFF ALL IN FEB. INCLUDES 8TRK, 14TRK + 24TRK NOS. - 2 - 24TRKS -

Bias NOISE - will see him TONITE.

12-16 RON RAKON - BOB LEAR "GRATEFUL DEAD"

WANTS TO RUN 23 WKS - JAMES J. OLLARD 617-434-4192 Ref. CHA.

12-16 "Dawnbreakers" MIKE DBX 216 - CHOP 18 won't stay Recor'd.

... ..

12-12 CRIS Skene - I called them, will call them by 4:30 PM.

... ..

... ..
AS SOON AS I GET SOME.

~~8-41 237011 1014~~

1-PORT 8' 2" WITH BATTERY PACK

16THK HAND ODD THK - 3M 79 8TH \$11700.00

1-18THK HAND 650.00

1-REMOTE CONTROL 25.00

1-TV SYNC UNIT - LOCK ^{COIL} VERT. SYNC 500.00

1-CARRYING CASE N.C.

\$13,100.00

order D 11846M3945F

1-15-75 promised

AIR TIME 2-1-75

- 12-18- 5:30 Chris Skene RTN. call - Lifter doesn't work in stop.
Bias Reg. SYNC Relay failed
- 12-18 11:30 Gary Stouffer RTN. call BOTH MACHINES NOT LOCKING IN SPEED,
Meters NOT reading OVI. RM FLYING TO S.D. IN MORNING.
- 12-17 1:55 MR. HAINES 925-7415 RTN. call RE UCLA Letter 12-12-74, I will
accept the deal & TOLD HIM SO.
- 12-17 2:32 Rob. - 457-3445 CAROL WANTS ME TO call him. (Village)
Probably not a serious inquiry - ELS Reg. call him when I see him
- 12-17 2:40 Ken Clark - 999-1544 WANTS LITERATURE on tape, I have a set
CENTRAL TRADING Co. 999 N. SUP. BLVD. SUITE 314 ELSONGO 90245
I should call GONFERN & check with them & then call him back.
- 2:45 Larry - 457-1111 - 457-1111 - 457-1111
He will come up Wed. to see me.
- 3:15 Larry - 457-1111 - 457-1111 - 457-1111 (P.O. 457-1111)
When sent.
- 4:05 AMC Tech Center - 746 HAN "HAT" (ASTHMA) - 457-1111
Today.
- 4:12 JIM RITTENHOUSE - Time Code GEN. WON'T WORK INTO LO & LOAD,
will send it to us when possible.
- 4:16 246-2655 - RUSS - WANTED TO KNOW ABOUT US PAYING him the money we
owe him on Fri. as promised. TOLD him to clean his dirty floor in back
He will tomorrow morn.
- 4:20 HOLLYWOOD SOUND - Jess PUNCHOUT POPS. & WOW
- 4:22 RO KILLEN - 887-0066 MUNTZ T.V.
- 4:45 RON @ ROUND RECORDS - WANT ME TO come up to close deal on 16TRK machine
& deliver 14TRK rental. AM leaving on 6:00 PM flight
- 4:55 AMC Tech Center - 746 HAN - 457-1111 - 457-1111 - 457-1111
457-1111 - 457-1111 - 457-1111 - 457-1111
- 12-18 9:54 Jessie Hodges - PUNCHOUT NOISE & WOW. TALK TO DAVID when I
have info on delivery of machine.
- 1:30 Les Johnson - Will bring 40TRK heads to me. is working on 2
16TRK orders. Can deliver 2-24TRK sets in 2 wks. Will call back.
- 1:52 LES JOHNSON - PRICE ON 40TRK heads - he will call back.
- 2:01 Called LES JOHNSON & TOLD him we found price of 40TRK NOS.
- 2:02 LES JOHNSON - Called & will be here by 1:00 PM. 457-1111
- 2:10 MICK LAMM - 457-1111 - 457-1111 - 457-1111 - 457-1111
457-1111 - 457-1111 - 457-1111 - 457-1111

12-18 @ 5:15 PM.

622-2021 622-7569

3:27 - Mike H. ... CONTACT LEON RUSSELL - what ALBUMS were recorded on 40TH.
WAS TOLD AME, O'NEARA OF CENTRAL TRADING CO. IS A "PIRATE".

10:30 Tried to call down Breakers - NO RNS.

12-19-74 DAY- LG MODULES

2-17 - 3-7 Bill says that Chris called him and told him ~~the bank~~ the bank doesn't have it, which is the truth. We will check with their bank again.

10:12 Lillian Johnson A/A ASKING ABOUT MONEY I OWE ON MY ACCOUNT.

1. 2nd CO. - 1st Air Force (AF) - 5 - SUPERVISOR OF VIDEO
DATA - 1st Air Force - 1st Air Force - 1st Air Force
16TRK - 17,500 ⁰⁰ + BLACK BOX TO CONVERT SMPTE TO VERT. DRIVE
MAGNETEK 1st DATATRON SYSTEM TO BE INSTALLED IN 3 MONTHS.

2:26 P

38 TUM 1, 2 - ~~UNIT~~ 1 - 1 order 2 - 1 order 3 - 1 order 4 - 1 order
STANDARD SYNC PANEL. 3 Remote SHUTTLES. 2-Search UNITS.
2-2" EDITING BLOCKS 2-LIM/D'SER

6:35 Greg PINE 615-385-1760 ALASON Research, Left for the day.

6:37 GERRY STAUFFER - DAVID ELLIOT 463-8565 (714) Bookkeeper -
CLIFFORD II 714-463-6504 talked to him. He will chase down all
checks tomorrow afternoon & call me.

6. He is a person higher up than I, and he will have his heads by noon tomorrow.

6:49 Called Ken Ohara - Central Trading. 640-1068 No Answer.

7:35 TOM KNOX - WANTS TAPE LIFTERS TO LIFT HIGHOL. WE ~~MOVE~~ ^{AGREED THAT IF} ~~HE~~ AM GOING OVER THERE ~~SAT~~ SAT. MORN. HE WILL CALL FIRST.

$\frac{1}{2} \times 8 \text{ m}$ 11' 9" 170, 600 1000 1000 1000 1000 1000 1000 1000

11:45 Jessie - HOLLYWOOD BND. 465-6121. WANTS 16TH REPAIRED, I WILL PICK UP.
TO BE RETURNED MONDAY. WOW & SPEED PROBLEMS.

11:49 JACKSON BAKER 469-3703 I Have Heads & Will Deliver by 12:15.

11:50 Greg Pine 815-385-1780 I called, He's NOT IN. He should call back.

$\frac{1}{2} \cdot \frac{3}{16} \cdot \frac{1}{4} = 784-2360$

- 12-30-74 5:02 MR. MORIKAWA called. IRE will be here ON 1-7-75 with a MR. SUGANO, a critic, WANTS 4 TRK with 14 inch reels. TOLD him I will have more data by need on the 40TRK.
- 12-31-74 5:32 PAUL BEAVER, no PART add or phone, I will speak @ 5:12 PM 384-0458.
- 1-2-75 2:11 called JACKSON BAKER 484-5103, He wasn't in. He will call me.
- approx 1:30 Greg Harris called 483-2371. wanted job. I said not for at least a month.
- 2:31 ALAN BYERS called. asked if there was anything they could do about the damaged 16TH cover. I said that I was handling it.
- 2:34 MIKE PRAZIER - meters band when reel is dropped onto reel hub.
Dawn Breakers.
- 5:03 called MR. NESSO 843-0944 (Will) cost approx \$450.00 for installation.
Heater man.
- 5:06 JONI said she would stop smoking!!! IT will ONLY cost me approx \$300.00 to send her to "Schick" for training. She will pay it back by stoppons taking \$5.00/wk out of her pay check.
- 5:12 called BEVERLEY @ EVANS STATIONERS 842-4148 & told her we would mail out a check to her tomorrow. We owe \$209.66,
- 5:16 called BRIAN @ PARAMOUNT 461-3717, WANTS TO know how much will the 24TH heads cost. 24TRK is needed by JAN 17TH for 9-10 days & then 2WK break & then needed forever.
- 5:23 JACKSON BAKER called looked @ one of the new STUDERS.
I said I would sell them @ 24TRK, set up for 16TRK only for under \$20,000
" " " " take them to lunch tomorrow if they would see the 24TH here.
- 5:41 Peter Hilton - meet him Monday nite
- 5:49 Peter BERGMAN - Paul Beaver wanted to know when machine will be ready. I told him tomorrow afternoon.
- 7:35 PAUL called & asked for meeting with her. We agreed to meet at the CUSTAWAYS @ 2:00 PM FRIDAY.
- 1-3-75 2:05 HOLLYWOOD SOUND wanted to know when 16TRK will be ready. I said I would call them back at 3:30p.
- 4:00 I called Hollywood Sound & said the TRK will be ready within Monday
- 4:03 called K... He wants... Mike Ken & Reader. Last

1-7-75

- 10:06 Called Mike & Karen & John & Karen 301-0170. Channel 8. "I'll be there" work yesterday, but works now.
- 10:10 called Ken @ Village 478-8227. NOT IN.
- 10:12 Called RONDA @ Bolic - TINA WANTS TO SEE ME @ 3:00 PM @ Bolic.
- 10:31 called " " - Agreed that I will call her when I'm ready to come over.
- 1:38 ^{ET} Called SUSAN Strasberg 211-5424, w/ " " we may meet about 1:45 PM. 3-STATION. CHK @ Electronic City.
- 1:40 FRONTIER AUDIO called. WANT FIRM DATE ON DELIV. of 4TRK. by 10TH.
- 1:41 Keri Village - Problems. RUND to play problems. Tape tests. ^{LIGHT} SLAM ~~NOT~~ IS OUT.
- 3:22 Called TOM R. 301-870-1111. Series # M25 is the old tape test type.
- 3:34 called pete at Sound Labs 411-8455. Wanted to know about moving record head further into tape path on 24TRK will call back.
- 3:58 Bill BLUE called. Said a shorted 1.0 amp cap was part of his problem.
- 4:06 ^{called} TOM HARVEY 870-6011 for padro. Cabinet maker's name? He will call back. Name is GARY BONAR 347-9423
- 4:11 called Brian 461-3717.
- 4:14 called Tom Weir - WANTS TO RENT 8TRK. PRICES ON RENTING & LEASING.
- 4:21 called Dave Schweininger 883-8733 NOT IN. will be in at about 6 PM.
- 4:37 Bolic SOUND called, TINA WANTS TO see me now. I'm going there now.
- 6:34 JUST RETURNED FROM Bolic. TINA WANTS ME TO OVERSEE their OPERATION IN the technical area. I will do so for \$50.00/hr. PORTAL to PORTAL Charge for today \$100.00

1-8-75

11:58 RTN. CALL TO BRIAN @ PARAMOUNT 461-3717

1-9-75

- 4:45 PM. - HAS ORDERED 1-821A-104-24TRK WITH 16TRK HEAD'S.
JACKSON BAKER AUDIO ARTS CAPITOL RESERVE FINANCIAL CORP.
2300 SANTA MONICA BLVD. LA. 90064 658-4300
- William Rogers -

7:14 ^{called} TOM R. NOT 381-0173 - N.A.

RETURN Spk to PAT'S. WIFE.

1-6-75

- 12:21 Called Tom Harney 415-382-7149 interested in 8TRK. CONV. to 11TRK. N. A.
- 12:22 Called Richard Ketz 783-7356 U 11TRK. Allegro SOUND. Ans. S&K.
found series 23 for \$6500.00 - '13 A TALKER - I quoted him \$5000.00 with
the old 3-M deck we have. He wants something around \$6500.00.
- 12:47 Called Hollywood Sound Told Jess I will try to get it to him. by
2:00 PM. (the 11TRK.)
- 12:56 Tom Harney called. - HUN SOUND. WANTS 16TRK Machine but setup
for now for 8TRK.
- 1:19 Jackson Baker called. WANTS prices on 24TRK. \$25,000.00
16TRK \$33,000.00 - WANTS prices on 24TRK, but with 16TRK and 8TRK options.
- 1:41 ~~Called Tom Harney~~ called. is having a problem in Village
Bias Reg. Problems. WANTS help, I looked it a bit. Told him I'm
working on the problem.
- 1:57 Called Tom Harney - BUSY
- 2:03 ^{LAYMAN}
Deany from Round Records called. SOUND IN BOX 1166 SAN KRFA
44902
GAVE INFO TO Carol to DO. ATTN.
Paid for by ANDY
- 2:08 BUSY - TOM HARNEY
- 2:19 Called Jackson Baker 469-5103. GAVE HIM prices of 24TRK with
16TRK capability only for 21,870.00. I also said if the price is too high
I would sell it to him for 2090.00 as agreed earlier.
- 2:22 Tom Harney called. I quoted price on 16 TRK only for 15,200.00
He said too much & I suggested him buying an 8TRK for now & trading it in
for a 11TRK later.
- 3:02 Leo Hulsman told him machine will be ready tomorrow.
- 3:06 ^{called}
Rod Stephens ~~870-8000~~ X 70 8000, Rod is interested in SYNC SYSTEM project. When can we meet.
He will call back.
- 4:33 Called Bill Elder 656-2866 spills tape in rewind. I will pickup
machine. I will call first
- 4:38 Called Tom Harney 870-6011. WANTS to see me during the day.

1-9-75

11:30 Terry @ Mama Joes Called. Meeting with Chuck Johnson @ 5:40 PM Friday

2:11 ^{called} Tom Miller - 361-0173 - machine was working the other night. Would like me to come over to see it. Track 18 wouldn't stay into record once. Increase tape lifter's height. ~~Call him tomorrow~~

3:26 called Jackson Barker 469-5103 Cabinet height 30" high. Wants us to come over & check out cabinet ideas.

5:41 AM call from Tien Audio 214-690-0055. Tonn ^{re} delivery of 4TH. Customer wants machine by 18th. Re: sand blast of motor shaft 5000/shaft.

4:57 ^{called} Bill Rogers @ Capital Cosmetics Finishing Corp 650-1131. He will be here at 11:00 AM Friday.

1-10-75

12:31 Brian Lentzler - Ever, thing Audio - wanted a 24TH for rental by the 24th of Jan for 6 wks. I said no

3:11 AM call Bruce Morrison Electric 653-8280 - wants a 24TH needs by Feb. 1st 1975. I am willing to pay rental on a 24TH until their machine is ready.

5:40 Jackson Barker called - will send ~~some~~ ^{some} toward down. I told him delivery will be mid Feb.

11:54 ^{BRUCE MORRISON called on 1-10-75 expressed interest in buying machine 653-8280}
Bill Pratt - ELECTRA RECORDS asked about 24TH system (24TH, some 4TH) will call him next week about details about order.

1:37 ^{called} Motilayan ^{1143 N. POSENTIN DR. ANN ARBOR MI} 874-6443 tape station for 40TH system.

11:50 Tom Pirox - Told him I'll be there at 3:00 PM meters jump when user is unplug. ~~Re: WIND~~ Re: WIND to plug - tape lifter's drop, delayed on 24TH. 18 won't stay in record. 17 WNT. REC. LIGHT. CLK WNT.

3:11 Preamp preamp - EDITING BLANKS. Plug in preamp for to replace sync rec. for dual playback. Wants two of them. I will call back when we call him. TH 16 ERASES BUT DOES NOT RECORD. - Call Bill on when I can see him.

5:33 Freddie Piro 982-0303, wants to send in 24TH. for bias changes, will deliver Thurs. Nite about 6:30 PM.

5:38 Bryan 461-3717 - Don't need the 24TH until the 1st. frequency response problems. Carve is complaining. 1000 BUMP

1-14-75

MONTROSE - BOWLING ALLEY
TUES, HONOLULU
9:00 PM

9:00 PM - 134 | 614-213-985-6100
RT. HOUSE

DAILY NOTES

12:14 JOHN ELDRIDGE - 4THK when going into record
214-630-1262 call him when free.

3:52 Gary Stauffer - V.S.O. SYNC LOCK + BATTERY PUMP
P 5'00⁰⁰ - DAVISON
P 2480⁰⁰ - DANN BRENNERS
4000⁰⁰ RENT

SAC He will be up to see me wed. to clear up the Bearkeeping

5:51 Gary Stauffer - VENT DRIVE - is going to deliver machine to the

6:01 Jim Jordan 464 1591 776 RENTING. WANTS to see me
ABOUT 6 PM. 112. NEXT WEEK. - Working with Gary Stauffer
IMPACT VHS. X43-3232.

1-22-75

9:04 DICK VORHEES worked up \$5000⁰⁰, \$10,400⁰⁰ DOWN. WITH 3 YRS.
Bal.

9:13 Steve Mitchell - COMPACT VIDEO - WORKING WITH GARY STAUFFER

9:38 MR. MORICANA WANTS TO SEE ME SUNDAY 11:00 AM,
Will call

12:31 SUZAN STRASSER 4550 DENSMORE AVE. 1 BLK W. MASTER
1/2 SO. VENTURA 1.00 PM. SMT.

12:25 JACK CUSHIN 475 4987

1-24-75

10:50 ^{Called} John Eldridge - OUT TO LUNCH. He will call back 1:00 PM

11:28 NRELE EN 1662, 1812 -

JOHN ELDRIDGE - STATUS OF REMOTE CONTROL ON 24THK?
- Serial 1023 -
WANTS B/W GLOVES for paper.

1-28-75

10:30 - GED SMITH - SCIENTOLOG RE 14THK & 4THK, IS COMING IN
THIS MORNING.

JOANNE - RATS 347-8558

1-14-75

11:05 DOUG OLIVEN - OLIVER ENGINEERING. Will meet with me @ 2:30 PM

11:05 WANTS A 24THK AUDIO RECORDER. SOL-988-4401 800 24111 Space Research Corp. 1 1/16" x 1 3/8"
- WITH TIME BASE, SMPTE & FR 10,000 CPS! 4 MO. I Will call Back Thurs.
With more info & maybe a better price.

11:28 JACKSON BURKE - Will return call

DICK FORBES - UNITED WESTERN. INTERESTED IN A 24THK. Will build his own.
We will ~~build~~ sell him an old 3-M deck for 2000.00.

3:43 LEO HULSEMAN - Will have his 40THK by Thurs.!!!

3:45 ED COBB - WANTED TO KNOW when machine will be ready! I said 1 1/2 hrs.

3:50 HOLLYWOOD SOUND JESS WANTS his machine!

5:40 CHUN? NO OUTPUT -

1-15-75

5:19 TOM HORDON - LATE

5:21 GARY FINE - MARK VINE - CRISTAL: WANTS A MACHINE BUT THE
615-356-7464 FOR EVALUATION IN 1 MONTH.

6:29 ARLEN BEYER - WANTED 16THK for TOMORROW MORNING.

3:00 JEAN PETERSON AMC -

1-17-75

11:36 DICK FORBES - ASKED ABOUT M... 24THK RECORDER. I said...
HAS BEEN ON A NOISE REDUCER.

12:49 JESSIE - HOLLYWOOD SOUND - 24THK

3:04 BRIAN 461-3717 A - 100~ @ 30 IPS. 6:30 PM

4:38 TOM HORDON 566-3111 OF 66, 361 0115 STION. Delivery sometime
5:15 NEXT WEEK for 24THK Repair.

5:24 BRIAN - WANTED A 24THK for TONITE.

1-18-75

11:43 BRIAN

11:47 JOHN HARKIN - LEO RUSSELL -

11:54 M. P. JAR. 22 2 484 4 X 217- GIL 12, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 195, 196, 197, 198, 199, 200, 201, 202, 203, 204, 205, 206, 207, 208, 209, 210, 211, 212, 213, 214, 215, 216, 217, 218, 219, 220, 221, 222, 223, 224, 225, 226, 227, 228, 229, 230, 231, 232, 233, 234, 235, 236, 237, 238, 239, 240, 241, 242, 243, 244, 245, 246, 247, 248, 249, 250, 251, 252, 253, 254, 255, 256, 257, 258, 259, 260, 261, 262, 263, 264, 265, 266, 267, 268, 269, 270, 271, 272, 273, 274, 275, 276, 277, 278, 279, 280, 281, 282, 283, 284, 285, 286, 287, 288, 289, 290, 291, 292, 293, 294, 295, 296, 297, 298, 299, 300, 301, 302, 303, 304, 305, 306, 307, 308, 309, 310, 311, 312, 313, 314, 315, 316, 317, 318, 319, 320, 321, 322, 323, 324, 325, 326, 327, 328, 329, 330, 331, 332, 333, 334, 335, 336, 337, 338, 339, 340, 341, 342, 343, 344, 345, 346, 347, 348, 349, 350, 351, 352, 353, 354, 355, 356, 357, 358, 359, 360, 361, 362, 363, 364, 365, 366, 367, 368, 369, 370, 371, 372, 373, 374, 375, 376, 377, 378, 379, 380, 381, 382, 383, 384, 385, 386, 387, 388, 389, 390, 391, 392, 393, 394, 395, 396, 397, 398, 399, 400, 401, 402, 403, 404, 405, 406, 407, 408, 409, 410, 411, 412, 413, 414, 415, 416, 417, 418, 419, 420, 421, 422, 423, 424, 425, 426, 427, 428, 429, 430, 431, 432, 433, 434, 435, 436, 437, 438, 439, 440, 441, 442, 443, 444, 445, 446, 447, 448, 449, 450, 451, 452, 453, 454, 455, 456, 457, 458, 459, 460, 461, 462, 463, 464, 465, 466, 467, 468, 469, 470, 471, 472, 473, 474, 475, 476, 477, 478, 479, 480, 481, 482, 483, 484, 485, 486, 487, 488, 489, 490, 491, 492, 493, 494, 495, 496, 497, 498, 499, 500, 501, 502, 503, 504, 505, 506, 507, 508, 509, 510, 511, 512, 513, 514, 515, 516, 517, 518, 519, 520, 521, 522, 523, 524, 525, 526, 527, 528, 529, 530, 531, 532, 533, 534, 535, 536, 537, 538, 539, 540, 541, 542, 543, 544, 545, 546, 547, 548, 549, 550, 551, 552, 553, 554, 555, 556, 557, 558, 559, 560, 561, 562, 563, 564, 565, 566, 567, 568, 569, 570, 571, 572, 573, 574, 575, 576, 577, 578, 579, 580, 581, 582, 583, 584, 585, 586, 587, 588, 589, 590, 591, 592, 593, 594, 595, 596, 597, 598, 599, 600, 601, 602, 603, 604, 605, 606, 607, 608, 609, 610, 611, 612, 613, 614, 615, 616, 617, 618, 619, 620, 621, 622, 623, 624, 625, 626, 627, 628, 629, 630, 631, 632, 633, 634, 635, 636, 637, 638, 639, 640, 641, 642, 643, 644, 645, 646, 647, 648, 649, 650, 651, 652, 653, 654, 655, 656, 657, 658, 659, 660, 661, 662, 663, 664, 665, 666, 667, 668, 669, 670, 671, 672, 673, 674, 675, 676, 677, 678, 679, 680, 681, 682, 683, 684, 685, 686, 687, 688, 689, 690, 691, 692, 693, 694, 695, 696, 697, 698, 699, 700, 701, 702, 703, 704, 705, 706, 707, 708, 709, 710, 711, 712, 713, 714, 715, 716, 717, 718, 719, 720, 721, 722, 723, 724, 725, 726, 727, 728, 729, 730, 731, 732, 733, 734, 735, 736, 737, 738, 739, 740, 741, 742, 743, 744, 745, 746, 747, 748, 749, 750, 751, 752, 753, 754, 755, 756, 757, 758, 759, 760, 761, 762, 763, 764, 765, 766, 767, 768, 769, 770, 771, 772, 773, 774, 775, 776, 777, 778, 779, 780, 781, 782, 783, 784, 785, 786, 787, 788, 789, 790, 791, 792, 793, 794, 795, 796, 797, 798, 799, 800, 801, 802, 803, 804, 805, 806, 807, 808, 809, 810, 811, 812, 813, 814, 815, 816, 817, 818, 819, 820, 821, 822, 823, 824, 825, 826, 827, 828, 829, 830, 831, 832, 833, 834, 835, 836, 837, 838, 839, 840, 841, 842, 843, 844, 845, 846, 847, 848, 849, 850, 851, 852, 853, 854, 855, 856, 857, 858, 859, 860, 861, 862, 863, 864, 865, 866, 867, 868, 869, 870, 871, 872, 873, 874, 875, 876, 877, 878, 879, 880, 881, 882, 883, 884, 885, 886, 887, 888, 889, 890, 891, 892, 893, 894, 895, 896, 897, 898, 899, 900, 901, 902, 903, 904, 905, 906, 907, 908, 909, 910, 911, 912, 913, 914, 915, 916, 917, 918, 919, 920, 921, 922, 923, 924, 925, 926, 927, 928, 929, 930, 931, 932, 933, 934, 935, 936, 937, 938, 939, 940, 941, 942, 943, 944, 945, 946, 947, 948, 949, 950, 951, 952, 953, 954, 955, 956, 957, 958, 959, 960, 961, 962, 963, 964, 965, 966, 967, 968, 969, 970, 971, 972, 973, 974, 975, 976, 977, 978, 979, 980, 981, 982, 983, 984, 985, 986, 987, 988, 989, 990, 991, 992, 993, 994, 995, 996, 997, 998, 999, 1000.

1-31-75

- 624-8807
4:28 MR. Shpall - wanted to know about letter I said I would call him back when Cris returned.
4:30 - 6:00 - 6:15 - call him when I'm free this weekend.
4:36 - Track 29 out - on Leo's machine. (Record.)
4:46 John - I.O.U. \$10 for gasoline - Joni
5:21 Peter 9:00 PM his place.
6:55 JOHN ELOREDGE

1-3-75

- 1:00 Pete Birkelike 843-3232 Compact Video Systems. WANTS LIT. ALSO WANTS INFO ON SMPTE Timecode Gen. & Vert. Dr./SMPTE.
1:10 Wes Dooley [449-1705] - is Recording in Ambassador
1:14 Pat Golden State Recorders WANTED INFO ON how to lock on channel INTO SYNC. ALSO WHAT THE "pte" does.
1:23 Don Green 764-2360 - 24TH. TOO LATE. Send Catalogs to him. 1091 12210 HARTST. N.H. 91605
1:30 Larry Johnson 462-9181 will send info on his sales idem.
1:37 Doug Oliver 874-6463 WANTED TO know STATUS of 40TH order. I said its NOT moving yet.
2:28 ANDY - CRITICISM - 8TH for Wes Dooley - I said I will be on call - Asked if SEARCHUNIT will be ready in next 2 M^{ts}.
2:38 Wes Dooley - CONCERT Tues. Nite. @ 8:00 PM. - 495 ELLIS PASADENA.
6:22 MR. MARIKAWA will be in @ about 11:30 to pick up DATA sheet. ON 40TH machine.

4:00 PM Paramount Chase Mellon - 272-3388

4:50 PM Bill Schall -

FRIDAY - 11:00 AM 3-13-75

2-10-75

11:20 DAVID HARTSELSON - HOLLYWOOD SNO. 465-4121 WANTED TO KNOW WHEN DIES.
ON 821 5TH PLANT will be available. I said they were being printed up.
WANTED TO KNOW WHEN I COULD CHECK THE WORK IN THE 16 TRK. I said I would
be over today.

11:24 Brian 461-3717 NO MONEY YET.

11:28 Bill Schall 624-8807 - 11:15 here. -

1:33 Brian 461-3717 - We keep 16 TRK for rebuilding - ROUND RECORDS.

1:43 Jack CASHIN 475-4987

2:02 Henry LEWIS - 624-7821 He was on another line. Left my name & number

1:40 PAUL DUNCAN - 472-4775 2 - SMPTE ~~RE~~ Reader BUT WANTS
WITHOUT CASE.

2:52 PAUL DUNCAN - 472-4775 Called him to quote \$2500/UNIT & 3 WKS.
WAS NOT IN.

2:57 LEO HUSEMAN - 879-3522 WANTED TO KNOW WHY THE INVOICE ON THE 40 TRK?
I TOLD HIM

3:03 Chase Mellon 272-3388 Told him about papers to be signed.

3:04 PAUL DUNCAN 272-3388 Quoted him \$2500, he was in doubt & said he
would call back. I doubt that he will buy.

3:19 Henry LEWIS 624-7821 Called. I told him probably \$5000 CLK will
be sent out by wed. He asked for a status report Thursday.

8:10 JOHN ELDRIDGE 214-348-3935 Machine DOWN - FITTER - BLOCK.
WANTS SKIZ - ~~PRE~~ AMP CHASSIS - Remote SHUTTLE.
879-5522

9:45 ED LOBB 788-1480 Meet @ 10:30 AM - PRODUCER'S WORKSHOP.

2-11-73

- 9:55 JALH CASHIN 475-4487 - Told him machine will be in his place by 11:30 AM
- 9:57 Chase Mellon 272-3388 - Told him I will be in his office @ 11:00 AM
- 10:00 ALAN WIENS 842-7551 - Sundia
- 10:02 Bill Spaul - 624-8807 Called, wanted to know when I would be in his office.
I said I would after seeing Chase.
- 12:51 Harold HAINES - UCLA 825-7915 HA.
- 4:33 PETE - SOUND LABS - 466-3463 WANTS STEPHENS 24TRK. for rent. LOOK IN future
for sale of one or two 24TRKS to them. WANT ~~447~~ 8110 SYNC PANEL.
- 4:44 TOM HEARDEN - WANTS CHECK ON CAR.
- 5:03 ED COBB - 502 @ 15 IPS still too high. Is bringing in boards. I'll change PETS
to T13's.
- 5:12 TIM WALKER - 478-8227 WAS NOT IN his office.
- 5:58 PETE - SOUND LABS - 466-3463 - 24TRK - PLAYBACK FROM 16TRK. WANTS a
24TRK P.B. Head + PTC & LINE AMPS IN MULTI BRACKET.
FIND OUT QUIL. of Head from AMC + chassis? & call him before
NOON.
- 6:17 Rod 870-8011 has SMPT GEN - OUTPUT POOR DRIVE. READOUT Lip Bad,
IS COMING over @ about 7:00 PM.

2-12-75

APTS —

- BEAVER - Chase Mellon

- ~~TRELOAR~~

2:00 PM - OLIVER \$4000

I O Rod - \$2000.00

- 11:26 - Geo SMITH - wanted to know if there was anyone that could build the 24TRK.
I said I didn't know.
- 11:38 - NBC - MR. wanted to know track
- 11:42 - MR HAINES UCLA - TOLD HIM WE NEED A CHECK IN ADVANCE.
- 11:55 - NMC - LESLIE JOHNSON - Home sick - Bill Graham will call me after lunch on price &
delivery of a 24TRK play head.
- 12:01 - PETE SOUND LABS 466-3463 TOLD HIM WE WOULD NOT HAVE ANSWER UNTIL AFTER LUNCH.
- 1:15 - BARBARA ⁴¹⁵ - 457-4220 ROUND RECORDS - wanted to know when their
machine will be delivered, wants to be called when its ready.

2-12-75

1:38 - JACK CUSHIN 475-4987 - WANTS @ 15TRK BETWEEN THE 20TH & 27TH

1:47 - Bill Graham AMC - 24TRK. Play head

4:21 - Chase Mellon 272-3387 called is TRYING Release to Shpall on machine. Will try to get monthly payments down to \$1000.00/ with interest. Get the insurance on the Capitol equipment to be co signed by the Beaver Estate.

4:26 Tim Walker - Village went home for the day.

4:27 Bill Graham - AMC - Play head will be ready in one week.

4:37 Pete Sound Labs 466-3413 quoted 4000.00 & 2WKS TO ADD 8 more tracks to his 16TRK machine, plus one play head. 2000.00 IN FRONT.

4:40 Jackson Baker 469-5103 - Wanted Remote & AUTO LOCATOR.

4:45 Chase Mellon 1st 3000.00 bal @ 2000.00 ? Will work with Shpall to try to improve it.

4:52 Janet Frontier Audio 214-690-0055

5:01 Chase Mellon 3000.00 bal @ 10 DAY & 2000.00 / month @ 7% / AN.

2-13-75 10:10 ERIC Prestig 851-7818 - I'll be there @ around 1:15 PM.

10:14 Harold Haines UCLA 825-7915 said he would walk through the paper work for the check.

10:34 DR. FORD 766-0995 - 4:15 -

10:36 DAVID - HOLLYWOOD SND. 465-6121 - already handled by Mike. (good term.)

10:42 Janet - Frontier Audio 214-690-0055 - where is my motor. She will light a fire under 'whats his name'.

10:54 Harold Haines 825-7915 Told him I was bringing over papers in 45 MINS.

10:53 Bill Graham Told him he might receive call from SOUND LABS to try to buy head.

3:06 PRODUCERS WORK SHOP 24TRK still has FLUTTER. They are bringing in machine.

3:07 HENRY LEWIN 624-7621 Told his associate NO MONEY YET. Will call him when MONEY ARRIVES.

4:03 Tim Walker - Has bias problems. Is going to advise that we get machine to improve Bias REGULATION.

5:41 BRIAN has erase problem on TRK 9 -. ALSO WHEN 24TRK?

6:45 - ERIC Prestig - WANTS me over to check 24TRK IN MORN. Bring ALIGNMENT TAPES, Jamie - 214-233-0906

2-14-75

10:24 CHRIS SKEEN - WANTS SEARCH UNIT. WANTS TO BRING MACHINE IN FOR bias ref. update
I said about next wed. He will call.

7:23 JOHN WHITMAN - HURT - Vert Drive to look up, would like machine by 8:30 AM
MONDAY. - 15 IPS - Recording Music -

2-18-75

10:17 STEVE BARALAN - Round Records - Round Records EDDIE WASHINGTON
WANTS a 16TH for his help in new deal.

10:56 Harold Haines 825-7415 Asked if check was ready. He will call back.

10:58 Berbaum 415-457-4220 Dean - I asked for 10:00 on delivery of their
machine tomorrow. He will call back.

11:11 ^{Dickmann} JOHN DICKMAN - BUTTERFLY PULK will be ready by the 25th. Call him
when in NBL 212-247-8300 X 2301
~~Bill Kover - checked with him to see if check was mailed yet. L.R.~~

1:26 BOB WANTED help in knowing what parts to use in a project.

11:30 Harold Haines - Form 5 went down to a department & has not been signed
yet. Check won't be ready now until next Tues.

2:30 Bill Spall - WANTS EQUIPMENT schedule

3:37 GARY BARNETT - Needs - WANTS to build them.

3:54 - ALLEN GASKER - MONDAY NITE DINNER 7:30 PM
2636 N. Beachwood 2-1775

4:12 DEAN LAYMAN - Don't have money there. I suggested they wire money
to OVP Bank from their BOSTON Bank tomorrow & I'll call Radio
IND. & try to delay pickup of rental until tomorrow afternoon.
I am to call him back.

4:15 ALLEN BYERS - Was NOT there, but I talked to his ASSISTANT. He
said to go ahead with the plan unless I hear from him

4:19 BRIAN @ PARAMOUNT WANTS LE CONTROL @ 30 IPS RB.

4:28 DEAN LEIMAN - wonder about INVOICES. Round Records 415-457-4220

4:42 DEAN LEIMAN - 415-457-4220
RON RAYN - UPSET ABOUT INV. 1797

5:07 RADIO IND. - BOB said ALLEN & TOM will be out tomorrow & will
talk about it then. - 757-40-1

RADIO SHACK - 845-1543

5:20 ED LEVER Village Records - Noise on "Punch in". What about MOTORS?
Is sending in machine for above.

2-19-75

11:00 AM DEAN LEIMAN 415-457-4220 They are very short of money. Will pay rental charge today, but can't pay partial but on machine until 4th day.

11:45 JOHN Freshette - NBC 845-7000 X 2241 - SKETCHES

1:30 PM JOHN DEILMAN X 2301 212-247-8300

11:51 JOHN DEILMAN 212-247-8300 X 2301

12:22 BRIAN - WANTS me over there @ 4:00 PM. with 250 Tape, Call first.

3:08 845-7000 X 2241 NBC JOHN Freshette. Wants Diags. Tomorrow.

3:18 MR. BORGES 504-834-5711 - 24TRK Needs 24TRK for rent. I suggested that he call Dean Ackeson @ Frontier Avian

3116 Metairie Rd., Metairie, LA 70001

3:23 JEAN PETERSON - AMC ^{1st check} check Bounced. - I will call her tomorrow & let her know if money

3:33 DEAN LEIMAN 415-457-4220 - He Ron doesn't want to pay all of the rent due to promise from ~~me~~ me that max will be \$2400.00

3:49 BRIAN - PARAMOUNT 461-3717 - Studio won't be clear until 5:00 AM.

3:57 DEAN LEIMAN 415-457-4220 - \$2200.00 This will be wired to our bank in the morning. I agreed to the lower rental charge. Ron states that I promise the max. would be \$2400.00, He will agree to a 700.00 increase over that but no more than that.

4:24 Ted NOVAL - Tape litter on 40TRK not working. Out of adjustment, He will correct,

6:00 BRIAN - PARAMOUNT - WANTS Black Anodized Sync Panel. I am to pick up 24TRK tomorrow & deliver to Audio Arts for the day.

2-20-75

10:56 ED COBB - 462-0904 - Told him what Sandy Freedman said to Chris. about taking his sweet time in paying the money they owe us.

11:05 BOBIE - MARY ANN 678-2832

12:22 KLET - JOHN WHITMAN & problems with resolver, He will call back.

12:36 KLET - JOHN WHITMAN - I said I would see him in 35 min.

3:41 JIM COOPER UCLA Music Dept. - said check will be cut tomorrow morn. He will call back time & where to pick it up.

3:51 JIM COOPER UCLA-Murphy Hall 2337 - pickup any time.

5:52 DAVID - 4TRK HOLLYWOOD SOUND - 4TRK blows fuses & +

2-21-75

~~621 1474~~ 833 3712
~~624 6195~~

10:30 AM AML JEAN PETERSON - TOLD HER THAT I SHOULD HAVE MONEY BY MONDAY.
I WILL CALL HER MONDAY.

10:56 AM DEAN LEIMAN 415-457-4220 TOLD HIM THAT I'M PICKING UP RENTAL TODAY &
DELIVERING THE NEW ONE SAT. HE WILL HAVE INFO ON MONEY BY TUES.

11:02 BOB WEAVER'S HOME 415-388-1473 TOLD A GIRL THERE THAT I WAS ON MY WAY TO PICK UP MACHINE
TOM HARVEY 762-7825

LOANED 1 SET 8 TRK CABLES TO TOM HARVEY

2-25-75

2:10 CRAIG CURTIS - WOC 845-7000 X2244 WE WILL SEND THE DINGS IN ONE HOUR.

2:11 AML JEAN PETERSON - TOLD HER TO DEPOSIT CHECK TOMORROW.

2:14 JEFF HARKING - SOUND IDEAS - 212-575-1711 RSW CALL - TALKING ABOUT A 24TRK.
WANTS IT IN 3 WKS. I SAID NO CAN DO - 5 WKS. WANTS TO PAY 24 PER WKS
WITH SEARCH UNIT + SPARES. I SAID OK. HE WILL CALL BACK.

2-26-75

4:05 DEAN LEIMAN 415-457-4220 - WON'T KNOW ABOUT MONEY UNTILL NEXT MON OR TUES.

4:57 DEAN LEIMAN 11 I WANT \$500.00 WIRED TO OUR BANK

5:16 RAIL RAYMOND 11 HE IS GOING TO BANK TO APPLY PRESSURE.

2-27-75

1:48 TED ROTHSTEIN 914-874-8900 CONVERT TO 24TRK.
GAVE HIM 10,000.00 + COST OF 16TRK HEADS.

DEAN LEIMAN
3:34 ~~RON RAYMOND~~ 415-457-4220 - WILL WIRE \$500.00
IN MORN.

3:46 BILL ROYCE - 556-4300 NAT IN. I WILL CALL
HIM ABOUT 5:30 PM.



2-27-75

3:56 - Ray Boyle 883-9481 Break through inc. - NO. ANS.
They developed a unit. 8TH cartridge

4:58 - Brian 461-3717 -

6:00 - Bill Rogers 658-4300 Not in.

~~2-27~~
8:10 - Glen Pace - Bias osc.? Remote?

2-28-75

1:59 - Bill Rogers 658-4300 We should rec'd LTR 4 days after delivery

2:24 - Glen Pace ~~658-4300~~ ~~461-3717~~ 462-4000 = Tom's start of
have it ready by 5:00 PM

2:09 - Don Fish - 801-374-1211 X 4151 ^{LA} DATATRON - LA? Glen Glen
call Arif

3-3-75

David - Hollywood SNO. - wants old drawings

3-4-75

11:54 Leo will send 4TH over to repair deck.

11:58 Jack Cashin 475-4187 wants his 8TH by tomorrow

3-5-75

2:02 Chuck Klags Premier 870-6011 NOT IN

3:59 Chuck Klags Premier 870-6011 - wants 2TH.

4:12 Chuck Klags - 15/30 ^{NAB} ^{feels} WANTS paper work - ~~4500.00~~ with simple receiver.

3-6-75

11:13 MR Borsetti - 415-489-1316 wants 8TH but with 16TH.

11:30 Bill Gorman - RMC asked him for delivery of 15TH 2TH & 16TH. He will call

11:34 MR. Borsetti 415-489-1316 - told him 8TH 11, 20 - 4TH with 16TH receiver would be

^{14,200.00}
(WANTS 24TH BY) (8TH SYNC panel to be traded in when they go to 16TH)
5-24-75 ERIC Prestige

851-7812 5-70 5:14 - 842-3444 not working
769-4931

105-41

1191

2 1/4" X 5 1/2" X 7 1/4"

TH 17 1/2

1191 more

PVM
Weston 4445 - 250.02
4446 - 269.00

9:15 PM
250

3-6-75

- 11:42 - ERIC PRESTIGE 851-7718 WANTS 24TRK BY 5-24-75 he will call back.
- 2:06 - JOHN DEULMAN - 212-247-8300 X2301 N.R.C. NOT THERE
- 2:07 - ERIC PRESTIGE 466-4306 NY
- 2:08 - TOM RUSSEL 918-582-5212 GONE TO BANK - WILL CALL BACK.
- 2:14 - BILL H. - HE HAS BEEN TOLD WE CAN GET IT FOR IN THE U.S. PROBLEM #24 BY 19th.
- 2:29 - TOM RUSSEL - 918-582-5212 WANTS RN 8 TRK. IN MAY, GAVE HIM A DISCOUNT OF \$1500 IF DOWN IS $\frac{1}{2}$ WITH ORDER.
- 2:37 - ERIC PRESTIGE 466-4306 - WILL CALL BY MONDAY MORNING ON 24TRK. GAVE HIM 15% WITH $\frac{1}{2}$ DOWN.
- 3:58 - BOB BOSTER - 394 6084 - WENT TO THE STORE ON 24TRK. THEY DON'T HAVE IT.

3-17-75

- 1:35 Dean Leiman 415-457-4220 HE WILL CALL ME BACK AS TO WHEN THEY WILL PAY BILLING
- 1:24 - ROSE ANTON " " " WANTS EXTRA PRICES OF REMOTE & TYPE PAPER & 821 PAPER.

3-18-75

- 1:40 Dean Leiman 415-457-4220 GAVE HIM PRICES OF 821 & REMOTE PAPER & REMOTE PAPER. RON SHOULD CALL ME TOMORROW.
- 1:52 ERIC PRESTIGE 851-7718 - NOT SURE BUT THINK THEY ARE NOT READY TO BUY anything
- 2:02 Richard Hoffman - 658-4300 THEY HAVE CHECK FOR US.
- 2:36 GEO SMITH - 469-2241 GAVE HIM DOLBY INTERFACE CRT. & PIN NO.
- 5:06 FRONTIER AUDIO - JOHN ELORIOGE -

3-18-75

PARTY.

- 12:46 MR BILKERSTAFF 420 4212 L.B. LOTY COLLAGE OUT TO LUNCH.
- 12:48 212-247-8300 DICK AMO N.R.C. HE WILL BE TOLD THAT I WILL HAVE SYNC SEP. SYSTEM FOR THEM BY MIDDLE OF NEXT WEEK.
- 3:29 OXNARD - ALAN GLASSER TRADE WINDS - FOR 3 WKS. ^{STAYING AT} VULCAN WHEEL MOTEL.
- 3-20-75
- 4:49 DEAN LEIMAN 415-457-4220 - THEY WILL SEND ~~12,500.00~~ ^{12,500.00} DOWN - ^{NEXT} BILLING.

5267

3:30 DEWAN LEIMAN 415-457-4220 He Will have Rod RAYON call me

operate properly Near end of fuel. I told him I'll be up there next week.

3:56 ^{Shelter records} Lawrence Goldberg - 680-1605 he will call back

3.55 MR. ~~PIKAT~~ PINSKY NATIONAL ACFT. 6515400, wanted to loan US

11.000 6-6-42 277-1042 Tell him I will be in hospital next week when I talk to my lawyer.

[illegible]

7/15 John Martin. S/N 562922. Length cables long enough to go to bottom of cabinet. Wants cables to be sent in advance. Wants machine by May 15th in L.A.

1.2' p.h. Gopher Root - 100 lbs per Rod + other materials 400' S.
Delivery in two weeks.

4122. *Scorpaenopsis* ? *g. subsp. n.* - 12. 1. 1900. (1. 1. 1900. 1. 1. 1900.)

3-27-75

11:50 LAWREY GOLDBERG - SHELTER RECORDS - 680-1805 11:00 MEETING.

1.55 DEAN LEIMAN 915-457-4220 - HE WILL CALL ME IN 1/2 HR TO 45 MINS.

1:58 Ira Chaddler - Stereo World 813-988-7059 8 track - WANTS L.T.

5. 25. 3

4:04

10:46 Joe Klein 65-9-3940 - PRODUCTION COMPANY - INTERESTED IN 16TH K. -
Will see me at the AES show

12/11/66 Sunday - 2nd day of the 12th Annual Meeting of the American Society of
Banks Closing early.

5-31-75 Howard Id/600K 212-247-8300 X2995 Not IN.

2:32 ERIC PRESTAGE - machine down @ GORD LEE -
MAY-13-K



SOUND LABS INC.
1800 N. Argyle Avenue • Suite 202
Hollywood, California 90028
466-3463

From the desk of

DYNAMIC BRAKING

AS LONG AS RATE GENERATOR IS
SPINNING, Q25 STAYS ON AND
Q27 STAYS ON

Q26 IS PLAY MODE X1 STOP -
BUT DURING PLAY, IT DEFEATS
TAPE LIFT CIRCUIT

IN PLAY - SHUTS OFF "PRE" LIGHT
THAN Q24, Q12 SHUTS OFF ... Q12
THEN SHUTS OFF Q15

DIFFERENTIAL AMP DRIVES Q21 INTO SATURATION
WHICH TURNS ON SUPPLY MOTOR

Fill's
Tom: 821-A
Surrey

11/5/85

Checked out Stephen's 24 track
machine with 16 track heads.

Did 15 ips Play back + Record Alignment
(+3, 15ips, 456)

Unweighted flutter .06 %

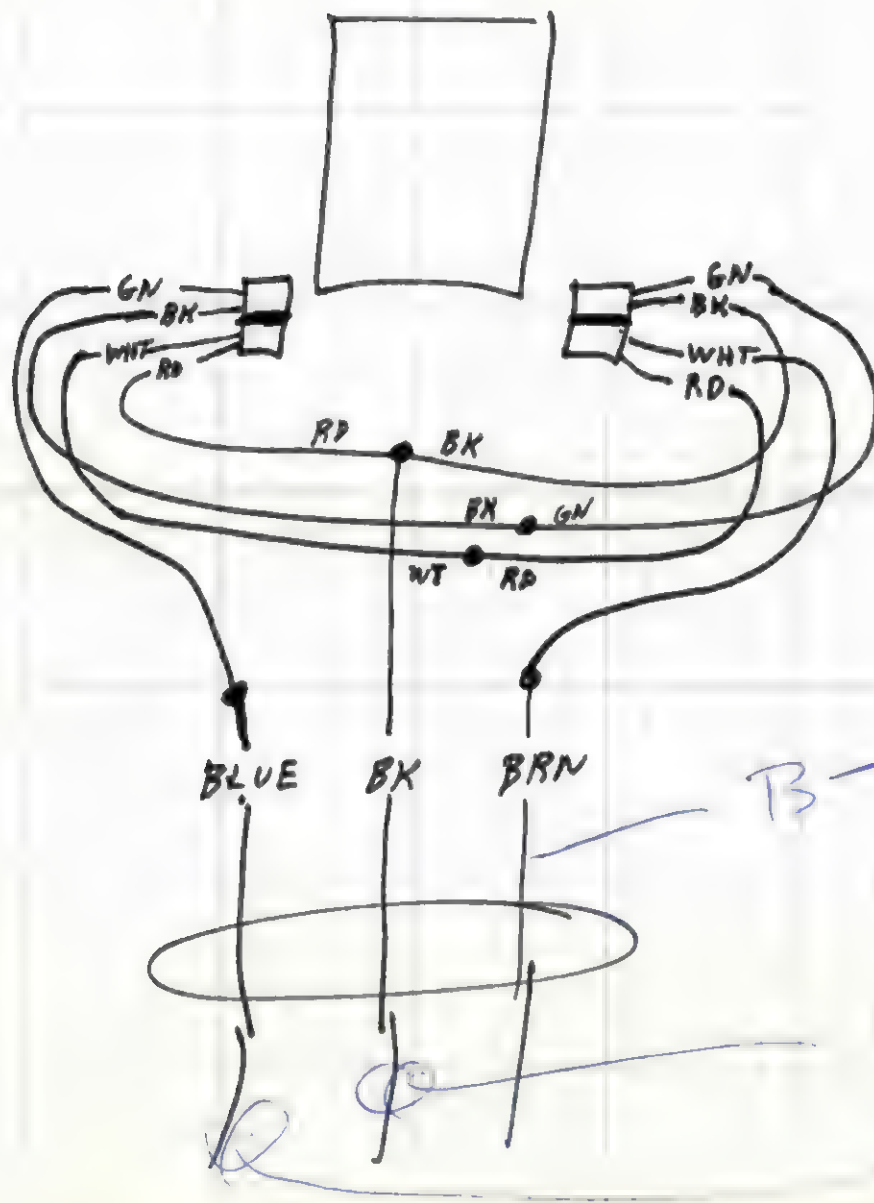
unweighted Noise: 50 dB typical
(Below +4)

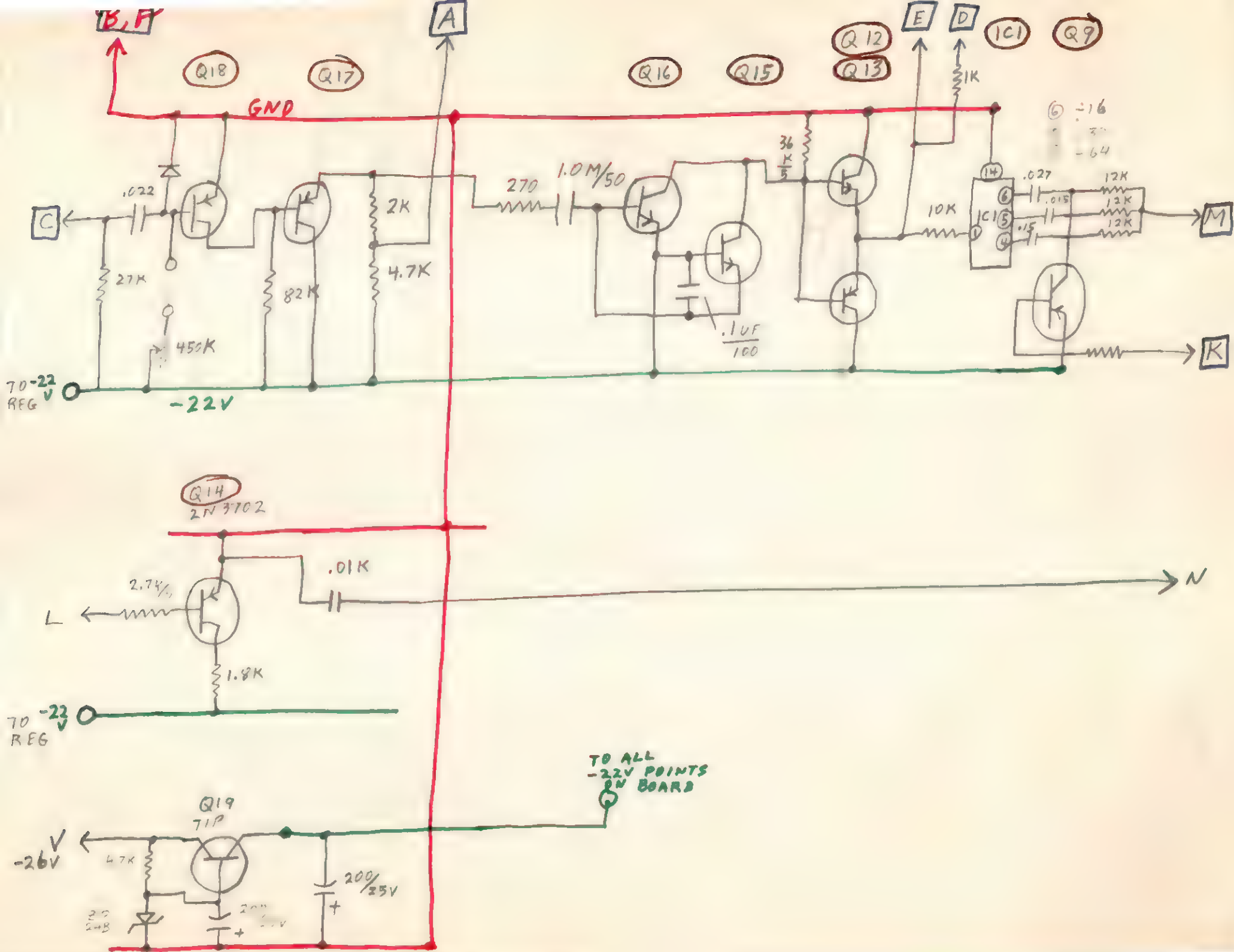
Tried to get #2 + #6 channels to
mess up during this whole time — But they
remain working, I could not spot anything else
out of the ordinary

— Jeff

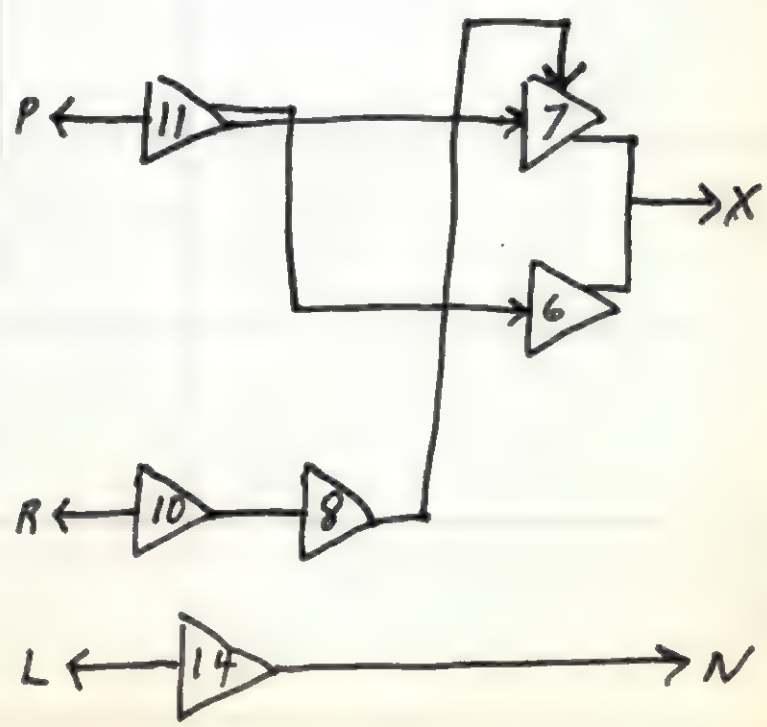
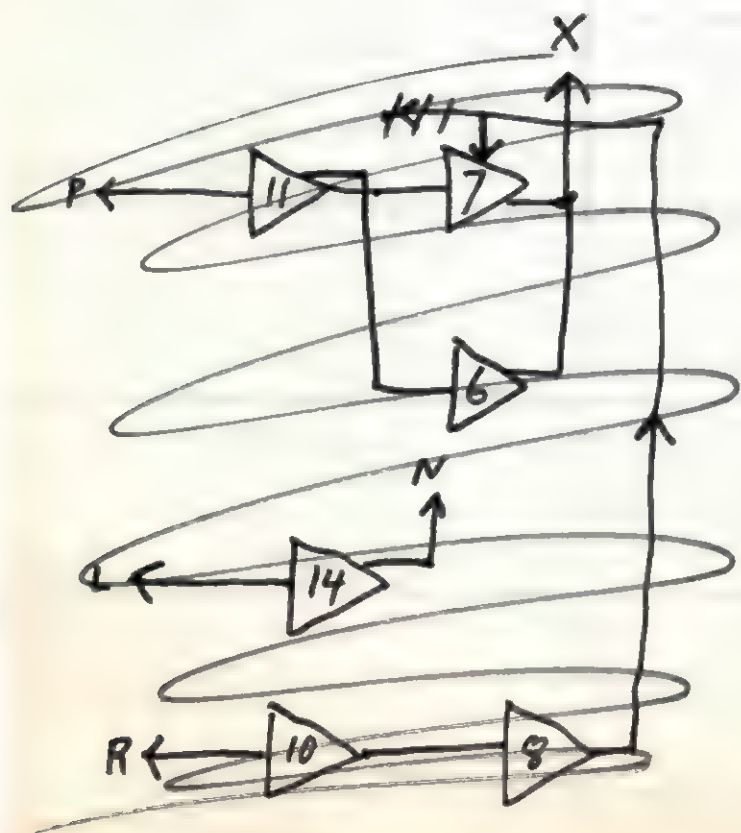
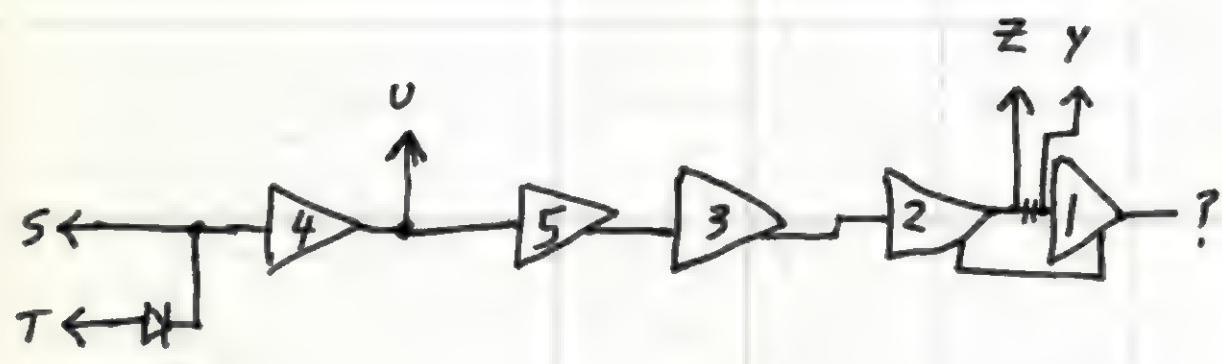
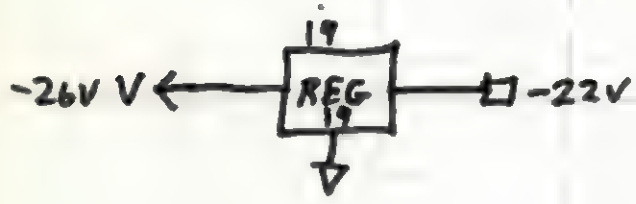
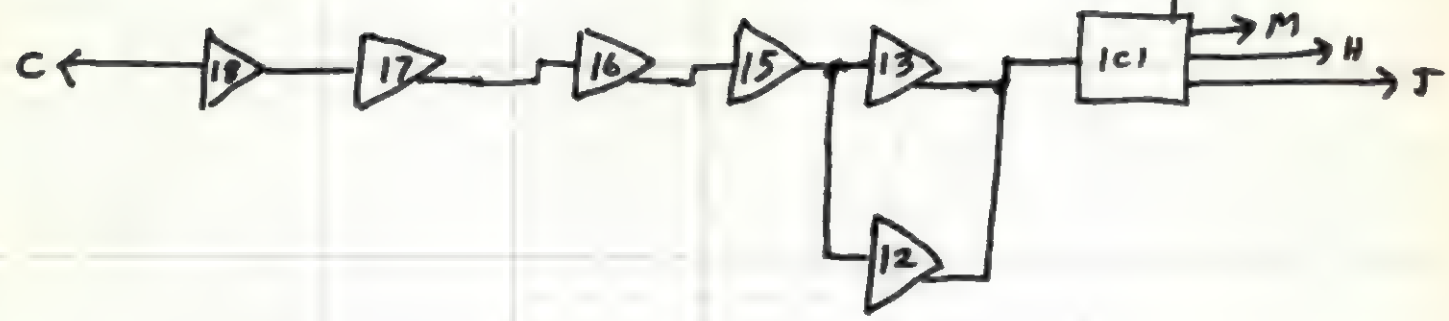
STEPHENS 16TH
MODIFIED TO
DUAL SENSOR
9-3-74 (B)

FRONT VIEW





STEPHENS 24
SERVO



HTTP://WWW.COLLECTOR-CLUB.COM/DET/MAIL

dedicated server process.
// global.asa, line 13

MAIL-
PROGRAM

Properties
Settings
Color palette
Display area

Broadcast

KKOL@FRA Lease net

805 606 1110

Vandenberg AFB 71

Physician choice Dr. Dell

UPDATE 805.606.1957

BITCASTING 085 11/2/ → 663.12 - 2613

ALLEN BRADLEY 7320

EECO TAPE READER CHT DIA 4.

DAN HALL -

RDET19991001223312

FMT CHAN 7
VIGILANCE

AUTO COM J ALLEN BRADLEY 73 CMC Log

EECO
READ

1-713 232 4477

MAILING

557 4427

800 227. 4247
1473 473 473

library

PURAMONT 10105 IN KOL 60

Pete Bartley

Telco Basement

1-800 609 6111

5555 Melrose Ave

208

mvbksm3m.gif

://WWWAPPS.UPS.COM
124...
HVN. 4 2...

V3279

V. L85

3295

76

3286

3287

3288

3289

3290

3291

3292

3293

3294

3295

3296

3297

3298

3299

3300

3301

3302

3303

3304

3305

3306

3307

3308

3309

3310

N h'29

h'29

h'29

h'29

h'29

h'29

h'29

h'29

h'29

h'29

h'29

h'29

h'29

h'29

h'29

h'29

h'29

h'29

h'29

h'29

h'29

h'29

h'29

h'29

h'29

h'29

h'29

X606

5AE

5AE

5AE

5AE

5AE

5AE

5AE

5AE

5AE

5AE

5AE

5AE

5AE

5AE

5AE

5AE

5AE

X500

X501

X502

X503

X504

X505

X506

X507

X508

X509

X510

X511

X512

X513

X514

X515

X516

X517

X518

X519

L64AF

L64AF

L64AF

L64AF

L64AF

L64AF

L64AF

L64AF

L64AF

L64AF

L64AF

L64AF

L64AF

L64AF

L64AF

L64AF

L64AF

L64AF

L64AF

7K6

→

→

→

→

→

→

→

→

PPL INSURANCE

1.800, 427, 9428

...the ...

22.0A ✓ 1184 111 27.0 26.1 111

[illegible]

1000	1000	X 22.18 ✓
1000	1000	1000 10 ✓
1000	1000	X 1000 ✓
1000	1000	X 1000 ✓
1000	1000	1000 10 ✓

1914

✓ 2-7		✓ 11	✓ 1021
✓ 6	✓ 5-12		
✓			
✓ X2101 - 2108			
✓ 23F9			
✓ 2184		796	1K1 ✓

The STEPHENS uniquely compact flexible Q-11 autolocator system is deceptively simple to operate. However, since it is also a very powerful recording tool, you should READ THIS MANUAL THOROUGHLY BEFORE attempting to operate the transport.

All the normal pre-operation procedures should be complied with. Load the machine with tape according to the Operation and Maintenance Manual Instructions for "play".

The Q-11 autolocating microprocessor system gives 10 program storage capabilities. All programs are randomly accessible either manually or automatically. Programming is performed via the remoted Q-11 control panel's keyboard.

GLOSSARY

BLANK:

A blank button on the Q11A control panel, used to modify the Q11A software.

NOW:

Indicates the program that the Q-11 autolocator is currently using.

NEXT:

Indicates the next program to be used when the current program is complete.

MODE:

Indicates how the transport will operate when the displayed program is executed. The digit "2" will cause the transport to play, the digit "4" to shuttle (rewind or forward). All other numbers will stop the machine.

DESTINATION:

A four digit display, in footage, of the location the transport is to go to.

CURRENT:

A four digit display of the position of the tape on the transport, or when programed, the tape speed.

PROGRAM:

One complete set of instructions for the transport to follow stored as one program.

Example:

1. Go into a play or shuttle mode.
2. Seek a location.
3. Upon reaching the location execute the next program.

The Q11A can store ten programs.

START:

A button on the Q-11 control panel. When pressed, it initiates automatic Q-11 control of the machine. The program that is displayed will now be executed.

TO OPERATE

1. Press program store (PROG STORE); button will flash. First number in display will flash.
2. Press the number of the program you will be setting up. The number will display in the "NOW" window.
3. Press the number of the program that you will be using "NEXT". The "flashing" will move toward the right as you make each entry.
4. Select the desired operating mode: 2 for "PLAY", or 4 for "SEARCH".
5. Enter a four digit destination footage number.

NOTE: YOU MUST ENTER ALL FOUR DIGITS.

Example: If footage number is 550 ft., you must enter 0550.

6. Repeat steps 1 thru 5 as necessary.
7. If it is desired to change the footage count (CURRENT), press footstore (FOOT STORE), and enter a four digit current footage number.

Now press START and the locator will operate the transport.

PROGRAMMING "ON THE FLY"

See "DUMP" on page 5.

A SAMPLE PROGRAM FOR STEPHENS Q11A

TAPE FOOTAGE	SONG STRUCTURE
0000-0039	Intro
0039-0100	Verse 1
0100-0256	Chorus 1
0256-0317	Verse 2
0317-0497	Chorus 2
0497-0700	Solo
0700-0761	Verse 3
0761-1138	Vamp chorus to fini

Producers request:

"Play only the verses 1 thru 3, then play the vamp to fini. Keep repeating it."

NOW	NEXT	MODE	DESTINATION	DESCRIPTION
1	2	4	0039	Shuttle to 39 feet.
2	3	2	0100	Play to 100 feet.
3	4	4	0256	Shuttle to 256 feet.
4	5	2	0317	Play to 317 feet.
5	6	4	0700	Shuttle to 700 feet.
6	1	2	1138	Play to 1138 feet.

Notice that "NEXT" links or calls the next program when the tape reaches the "DESTINATION", i.e. When the footage count displayed in "CURRENT" equals the footage count displayed in "DESTINATION".

Example 2: Repeat Solo over and over again.

NOW	NEXT	MODE	DESTINATION	DESCRIPTION
7	8	4	0497	Shuttle to 497 feet.
8	7	2	0700	Play to 700 feet.

The above will continuously replay the solo - for overdubs, mixing, - whatever.

Example 3: Play and repeat the complete song.

NOW	NEXT	MODE	DESTINATION	DESCRIPTION
0	9	4	0000	Shuttle to zero feet.
9	0	2	1138	Play to 1138 feet.

EXPANDED INSTRUCTIONS

BLANK

When the blank button is pressed, the PROG SELECT button will start to flash. Pressing the following numbers will implement the following changes;

- 1: The CURRENT window will display time at 15 IPS.
- 2: The CURRENT window will display footage.
- 3: The CURRENT window will display time at 30 IPS.
- 4: The CURRENT window will display the tape speed.
- 9: The CURRENT window will display the software version. (0883)

NOTE; Q11A cannot be programmed in "time." Therefor, when programming, the CURRENT display will display footage. When programming is complete, CURRENT will change back.

START

Initiates automatic control of the machine. The program displayed is then executed. To regain manual control of the machine, press STOP. If a program is manually stopped anywhere before it finds a location, pressing START will reinitiate the program at the point where it was stopped.

DESTINATION

The footage number that the displayed program will shuttle or play to.

DUMP

When pressing DUMP and then an unassigned program number, the "CURRENT" footage is loaded into the destination footage counters. The number pressed is automatically loaded into "NOW" and "NEXT", and the "MODE" window is loaded with the digit 4, indicating shuttle. This location can now be called at any time by pressing Program Select (PROG SELECT), the number and START. The machine will then fast shuttle to that destination and park. The Q11A will then disengage and the START light will go out. If START is pressed twice in succession, the machine will fast shuttle to the DESTINATION and go into play mode. The Q11 will then disengage and the START light will go out.

COMMAND CONTROLS

NOTE: When either FOOTSTORE, PROGRAM STORE, PROGRAM SELECT, or DUMP are chosen, one number in the digital display as well as one of the above buttons will flash, indicating a "ready to receive instruction" mode. The desired numbers can be loaded in via the keyboard with each digit appearing as it is selected.

FOOTSTORE

Allows manual change of the current footage display, i.e., at 78 feet into the tape, the operator decides he wants the current display to read "0000".

PROGRAM SELECT

When pressed, the PROGRAM SELECT will flash until a number is pressed. This becomes the program number. The display will then display this program.

PROGRAM STORE

Press Program Store (PROG STORE), the PROGRAM STORE button will start to flash as well as the first digit in the display window.

NOTE: (SELECTED NUMBERS WILL SHOW FROM LEFT TO RIGHT IN THE DISPLAY WINDOW AS THEY ARE ENTERED INTO PROGRAM STORE VIA THE KEYBOARD).

Punch in the numbers just as you would a telephone number 1240039 (1=NOW, 2=NEXT, 4=MODE, 0039=DESTINATION).

To set up subsequent programs, repeat the sequence of keystrokes denoted above. However, the order of "NOW" to "NEXT" does not have to be in numerical order. The program can be set up to go from program 1 to program 4 to program 9 etc.

END.